

The Journal of the American Medical Association.

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 1

CHICAGO, ILLINOIS

COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

JAIPUR.

SEPTEMBER 2, 1944

BLOOD LOSS IN SURGICAL OPERATIONS

CHAIRMAN'S ADDRESS

FREDERICK A. COLLIER, M.D.

CLARENCE E. CROOK, M.D.

AND

VIVIAN IOB, Ph.D.

ANN ARBOR, MICH.

The amount of blood lost during surgical operations of various types has been measured and reported by a number of observers. The facts disclosed by these observations have not been generally recognized, nor has their practical importance been sufficiently emphasized. In order to bring attention to this technical problem, the literature on it has been reviewed and further studies have been made as are here reported. Shock appearing during and after operation is still the apprehension of the surgeon and a menace to the patient. During the past three years an enormous amount of investigation on the subject of shock has added materially to our knowledge of it. One fact, however, remains clear: There is no single reliable test or clinical sign of impending shock, especially in anesthetic and postanesthetic states. By the time shock is recognized as such it is well established. Our ability to treat shock has improved, but it is far from satisfactory. The earlier the treatment is instituted the better the results, and if its advent is anticipated it may be prevented far easier than it may be cured. Though there are no positive early tests of impending shock, there is a large background of clinical observation from which to deduce that shock will appear under certain circumstances—burns involving 20 per cent or more of the body surface, severe dehydration, multiple fractures and wounds, crushing injuries, exposure to cold air or immersion in cold water, and extensive blood loss. It is well known that shock develops more readily with a given injury if there exists malnutrition or starvation, anemia, dehydration, physical or mental exhaustion, chronic illness or prolonged bed rest. With these facts available, one should be able to anticipate and usually prevent shock in the surgery in civilian hospitals.

In 1924 Gatch and Little¹ reported the first study of blood loss during some of the more common operations in general surgery in which accurate measurements of the losses were made. They pointed out that the amount of blood lost in the ordinary laparotomy is

not great but that in operations involving extensive dissection the loss may be excessive. They concluded that a patient in fairly good physical condition could lose from 600 to 700 cc. of blood without any apparent harmful effect on the postoperative course. Likewise an adult in good health does not manifest any serious effect from hemorrhage until the amount of blood lost is between 800 and 1,000 cc. Alexander Blain² in 1929, in commenting on his experience with 3,000 transfusions, stated that the amount of blood lost at operation is often several times greater than that estimated by the surgeon. He urged the preoperative correction of anemia and the immediate replacement of blood lost during operation and condemned delay in giving blood transfusions until after shock had developed. Collier and Maddock³ in 1932 measured blood loss during some of the ordinary operations and concluded that the amount of blood lost is always greater than the surgeon estimates. Windfeld⁴ in 1937 made direct measurements of blood loss during operations and concluded that the loss is often far greater than supposed, so that without appearing dangerous it may reduce the volume of the circulating blood considerably. Determination of hemoglobin concentrations before and after operation did not give quantitative information regarding the amount of blood lost. Pilcher and Sheard⁵ in 1937 estimated the blood loss by a photometric method and found that the average loss from prostatic resections was 479 cc. This finding stimulated efforts to secure better hemostasis, and in a second series studied following alterations in technic the average loss was reduced to 291 cc. A group of 49 general surgical cases was studied for comparison. Hubly⁶ in 1937 used this method to determine the hemostatic effect of congo red. White, Whitlaw, Sweet and Hurwitt⁷ in 1938 made an exhaustive study of blood loss in neurosurgical operations. They found that in the course of extensive intracranial operations the average loss was from 500 to 1,500 cc. They concluded that these patients rarely develop the typical shock state unless the loss is over 1,200 cc. or unless the loss is rapid. They urged greater attention to hemostasis at the expense of time and advocated discontinuing the operation if the loss exceeded 1,200 to 1,500 cc. Stewart and Rourke⁸ in 1938 studied changes in blood and

2. Blain, A.: Impressions Resulting from 3,000 Transfusions of Unmodified Blood, *Ann. Surg.* **89**: 189, 1929.

3. Collier, F. A., and Maddock, W. G.: Dehydration Attendant on Surgical Operations, *J. A. M. A.* **99**: 875 (Sept. 10) 1932.

4. Windfeld, P.: Blutverluste und Blutveränderungen bei Operationen, *Acta chir. Scandinav.* **79**: 453, 1937.

5. Pilcher, F., and Sheard, C.: Measurements on the Loss of Blood During Transurethral Prostatic Resection and Other Surgical Procedures, Determined by Spectrophotometric and Photometric Methods, *Proc. Staff Meet., Mayo Clin.* **12**: 209, 1937.

6. Hubly, J. W.: Hemostatic Effect of Congo Red in Transurethral Resection, *Proc. Staff Meet., Mayo Clin.* **12**: 213, 1937.

7. White, J. C.; Whitlaw, G. P.; Sweet, W. H., and Hurwitt, E. S.: Blood Loss During Neurosurgical Operations, *Ann. Surg.* **107**: 287, 1938.

8. Stewart, J. D., and Rourke, G. M.: Changes in Blood and Interstitial Fluid Resulting from Surgical Operations and Ether Anesthesia, *J. Clin. Investigation* **17**: 413, 1938.

Aided by a Grant from the Horace H. Rackham Fund.
From the Department of Surgery, University of Michigan Medical School.

Read before the Section on Surgery, General and Abdominal, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Gatch, W. D., and Little, W. D.: Amount of Blood Lost During Some of the More Common Operations, *J. A. M. A.* **83**: 1075 (Oct. 4) 1924.

interstitial fluid resulting from surgical operation and ether anesthesia. They pointed out that the hematocrit changes induced by trauma and blood loss of operation are not proportional to the blood loss and that the structurally important elements of blood plasma, that is protein, sodium and chloride, are accurately sustained by the body. They emphasized the fallacy of assuming a quantitative relationship between the changes in the concentration of hemoglobin or plasma protein and changes in the plasma volume.

Nadal⁹ in 1939 studied blood loss in orthopedic operations and found that patients losing over 20 per cent of the blood volume frequently showed clinical signs of shock. Leriche and Vasilaros¹⁰ in 1939

TABLE 1.—Blood Loss in Operations of Various Kinds in 626 Cases Compiled from the Literature

Operations	Number of Cases	Blood Loss		
		Maxi- mum, Cc.	Mini- mum, Cc.	Aver- age, Cc.
Brain operations (7).....	30	2,150	487	1,084
Postganglionic neurotomy Cr. N. V. (7, 10)	4	630	86	337
Spinal cord operations (7, 10).....	7	1,264	107	626
Thyroidectomies (1, 4, 5).....	29	1,118	16	237
Other neck operations (3, 5, 10).....	3	410	105	230
Mastectomies, radical (1, 3, 4, 5, 8, 10, 14)...	20	1,272	254	732
Mastectomies, simple (1, 5).....	5	220	180	200
Thoracic operations (8, 13).....	113	2,595	35	575
Biliary operations (1, 3, 4, 5, 10).....	16	400	51	100
Gastric operations (1, 3, 4, 5, 8, 10, 14).....	41	650	45	233
Splenectomies (4, 14).....	2	990	160	525
Intestinal operations above sigmoid (3, 14)	11	230	10	81
Appendectomies (1, 3, 5).....	14	62	4	13
Sigmoidal, rectal and anal operations (3, 5, 10, 14).....	21	1,220	8	377
Hernia operations (1, 3, 4, 5, 8).....	13	306	11	74
Miscellaneous abdominal operations (1, 3, 5, 10).....	6	546	14	218
Pelvic operations (1, 4, 5, 8, 10, 14).....	30	650	22	260
Prostatic resections, transurethral (5, 6, 11)	220	1,254	4	280
Kidney operations (1, 3, 4, 5).....	10	1,144	130	372
Orthopedic operations (1, 3, 9, 10, 14).....	31	1,564	40	441
Total.....	626			

The numbers following the names of operations refer to the footnotes cited in the text.

TABLE 2.—Relationship of Blood Loss to Total Blood Volume

Weight	Total Blood Volume	100 Cc. Loss
10 lbs.	450 cc.	22.0 %
20 lbs.	890 cc.	11.0 %
40 lbs.	1,600 cc.	6.2 %
80 lbs.	2,825 cc.	3.6 %
140 lbs.	5,000 cc.	2.0 %
200 lbs.	7,000 cc.	1.4 %

reported measurements of blood loss in twenty-nine operations of diverse character. They concluded that a loss even as small as 500 cc. of blood is not a matter of indifference to a body which is called on to effect the repair of trauma and disease. Nesbit and Conger¹¹ in 1941 measured blood loss associated with transurethral prostatectomy and stated that this determination is easily carried out at the time of operation and should be made a routine procedure, so that untoward blood losses may be immediately appreciated and corrected by transfusion. They urge the use of whole blood to replace the blood loss accurately. Wangenstein¹² in 1942 described a gravimetric method for

9. Nadal, J. W.: Blood Loss in Orthopedic Operations, *Univ. Hosp. Bull., Ann Arbor* 5: 74, 1939.

10. Leriche, R., and Vasilaros, E.: *De la perte de sang occasionnée par les diverses opérations: Contribution à l'étude de la maladie post-opératoire*, *Mém. Acad. de chir.* 65: 1242, 1939.

11. Nesbit, R. M., and Conger, K. B.: Studies of Blood Loss During Transurethral Prostatic Resection, *J. Urol.* 46: 713, 1941.

12. Wangenstein, O. H.: The Controlled Administration of Fluid to Surgical Patients, *Minnesota Med.* 25: 783, 1942.

determining the status of hydration and blood loss during operation. He advocated the replacement of minor blood loss by an amount of plasma 100 to 200 cc. greater than the blood lost, or if the loss is excessive it should be replaced by whole blood. He found the average blood loss from gastric resection to be 300 to 500 cc. In 1942 Buxton and White¹³ measured blood loss in 109 patients undergoing operations on and in the thorax. The loss in these operations was exceptionally large, averaging about 700 cc. for each stage thoracoplasty, 1,600 cc. in lobectomy and about the same for pneumonectomy. Large transfusions during operation were advised. Oppenheim, Pack, Abels and Rhoads¹⁴ in 1944 measured the amounts of blood lost in various abdominal operations and described a simplified method for carrying out this technic. The amount of blood lost was not excessive. However, they felt that a transfusion of 500 to 600 cc. of blood during the operation is of great benefit to patients operated on for cancer of the gastrointestinal tract. They advised the routine determination of blood loss especially in elderly patients with cardiovascular insufficiency in order to prevent the administration of unnecessarily large amounts of fluid.

In table 1 are shown blood losses from 626 operations collected from the data of these authors. The cases are grouped according to the types of operation, and the maximal, minimal and average losses are given. It was the unanimous conclusion of all who studied this problem that the blood losses in nearly every operation were greater than expected by the surgeon. The constant ooze of blood from large vascular fields leads to a large loss, of which the surgeon is frequently not cognizant. Accurate measurement of blood loss leads to an appreciation of the importance of better hemostasis. Nevertheless at times, in spite of every effort at hemostasis, the loss will still be large and transfusions should be planned in advance.

Analysis of the literature impresses one with the fact that not enough emphasis has been placed on the relation of the amount of blood lost to the total blood volume. Since the blood volume varies with the weight of the patient, it makes a vital difference whether a given amount of blood is lost from a large adult or from a small child. In table 2 are shown some figures illustrating the relationship of a 100 cc. blood loss to the blood volume in patients of differing weights.¹⁵ Blood comprises 77.7 cc. per kilogram of body weight in the male and 66.1 cc. per kilogram in the female.¹⁶ For all practical purposes one thirteenth of the body weight is blood, and cells make up 45 per cent of the blood volume in men and 40 per cent in women. A simple method of calculating blood volume is to allow 30 cc. of blood for every pound or 75 cc. for each kilogram of body weight. Stewart and Rourke⁸ showed blood loss in terms of percentage of total blood volume but did not comment on its critical relation to weight. Nadal⁹ pointed out the important relationship between the size of the patient and the amount of blood that could be lost before signs of shock would appear.

13. White, M. L., and Buxton, R. W.: Blood Loss in Thoracic Operations, *J. Thoracic Surg.* 12: 198, 1942.

14. Oppenheim, A.; Pack, G. T.; Abels, J. C., and Rhoads, C. F.: Estimation and Significance of Blood Loss During Gastrointestinal Surgery, *Ann. Surg.*, to be published.

15. Table 2 is adopted from Robinow and Hamilton (Blood Volume of Infants and Children: Studies with a New Method for Determination of Blood Volume, *Am. J. Surg.* 1940) and from Gibson and Evans.

16. Evans, K. A., Jr.: Clinical Studies of Blood Volume: Relation of Plasma and Total Blood Volume to Venous Pressure, Blood Velocity Rate, Physical Measurements, Age and Sex in Ninety Normal Humans, *J. Clin. Investigation* 16: 317, 1937.

Since several of the preceding studies were carried out in the University Hospital¹⁷ our surgical staff has come to realize the importance of a knowledge of blood loss during operation. Further investigations have been made to stress the necessity of admitting that blood will be lost, that its approximate amount should be known and that it should be replaced by blood. Fifty cases were studied, and 42 have been selected for presentation. The method used for determining blood loss was essentially that of Gatch and Little with the following exceptions:

1. Oxyhemoglobin was measured in the Evelyn photoelectric colorimeter.

2. The fluid from aspirator bottle, instrument and glove washings was kept separate from the washtub fluid.

3. The sample from the 50 liters of washtub fluid was taken directly from the washtub before the drapes and gauze sponges were removed. Controlled washings, using known amounts of blood on sample outfits of drapes and sponges, yielded an average recovery of 95 per cent. The detailed method was as follows:

With Evelyn's method, oxyhemoglobin was determined on the solution containing equal volumes of the following fractions:

1. Fluid from drapes and sponges extracted in washing machine in 50 liters of distilled water for two hours.

2. Aspirated fluid and water used to wash instruments and gloves diluted to 5 liters, or to 10 liters if necessary, and finally diluted 1:10, or 1:5, with distilled water. The solution was centrifuged to clarify it and diluted 1:1 with distilled water.

The patient's preoperative concentration of hemoglobin was determined at the same time.

Calculations:

$$\text{Gm. Hb lost} = \text{Gm. \% Hb from blood curve} \times \frac{1,000}{250}$$
$$\frac{\text{Hb lost}}{\text{pt's. preop. Hb}} \times 100 = \text{cc. blood lost}$$

The cases here presented were selected for study on the basis that, owing to their character, a high blood loss might be expected; and they were limited chiefly to five categories to facilitate comparison. Particular interest was centered in changes in the blood picture associated with hemorrhage. Therefore many patients, whose blood loss was minimal were excluded from the presentation. Consequently the blood loss in these groups does not represent average results from routine operations of their types. The operations were performed by ten surgeons from the resident staff.

In tables 3 to 8 are shown measured blood loss and its percentage of total blood volume, intravenous solutions given in the operating room, blood transfusions given during or immediately after operation, and the degree of hypotension stated in terms of 1 to 4 plus, in patients during various types of operation. In table 3 the blood loss from radical mastectomy is slightly higher than found by others, but, since these operations are always accompanied by such losses, transfusion during these operations has been made a routine at the University Hospital by our staff. Patient 27 developed a moderate hypotension, which was corrected by transfusion of blood equal in amount to the loss. In table 4 the blood loss associated with thyroidectomy is shown. These patients all presented large, recurrent or unusually toxic goiters, and the average blood loss was much higher than found in routine thyroidectomies. In 2 instances the loss was above 25 per cent of the blood volume, but the surgeon realized this fact and replaced the lost blood by transfusion during the operation.

In table 5 is shown a group of patients presenting difficult technical problems in surgery of the biliary tract. Many had been operated on previously. The majority were jaundiced, and in all the common duct was explored or reconstructed. The operations were long and the blood loss averaged nearly 600 cc. Case 41 is of interest since the blood loss of 1,065 cc. represented 41 per cent of the blood volume; the patient was emaciated and weighed only 86 pounds (39 Kg.). This

TABLE 3.—Blood Loss During Radical Mastectomy

Four women, nitrous oxide and ether									
Case Number and Sex	Age	Weight, Lbs.	Duration of Operation, Minutes	Blood Loss		Intravenous Solution During Operation, Cc.	Blood Transfusion, Cc.	Hypotension	
				Amount, Cc.	Total Volume, %				
1, ♀	59	215	147	827	12.8	1,200	450	+	
27, ♀	61	189	189	924	17.8	1,200	900	++	
29, ♀	34	121	168	529	14.6	1,200	450	0	
40, ♀	55	140	215	1,091	25.8	1,000	450	0	
Average, 821 cc., 17.7%									

TABLE 4.—Hemithyroidectomy and Blood Loss During Subtotal Thyroidectomy for Very Large, Toxic, Adenomatous Goiters

Eight cases									
Case Number and Sex	Age	Weight, Lbs.	Duration of Operation, Minutes	Blood Loss		Intravenous Solution During Operation, Cc.	Blood Transfusion, Cc.	Hypotension	
				Amount, Cc.	Total Volume, %				
2, ♀	53	94	110 *	234	8.3	1,400	0	0	
3, ♂	14	104	58 *	276	7.5	0	0	0	
9, ♀	44	150	140 *	409	9.1	1,000	0	0	
10, ♀	51	121	93 *	204	5.3	1,000	0	0	
15, ♂	58	185	121 *	389	6.0	1,000	0	0	
16, ♀	15	87	102 †	725	27.8	1,000	450	0	
20, ♀	15	87	110 †	688	26.4	700	450	0	
37, ♀	36	120	90 †	99	2.9	1,000	0	0	
Average, 379 cc., 11.7%									

* Tribromoethanol, nitrous oxide and ether.

† Tribromoethanol, nitrous oxide, local procaine.

TABLE 5.—Blood Loss During Secondary and Plastic Operations on the Biliary Tract

Eight cases, nitrous oxide and ether									
Case Number and Sex	Age	Weight, Lbs.	Duration of Operation, Minutes	Blood Loss		Intravenous Solution During Operation, Cc.	Blood Transfusion, Cc.	Hypotension	
				Amount, Cc.	Total Volume, %				
11, ♀	50	134	105	158	3.9	1,000	0	0	
14, ♂	54	110	220	412	10.5	760	450	+	
21, ♂	51	164	255	1,455	27.5	1,000	900	++	
22, ♂	50	178	113	242	3.8	1,100	450	0	
28, ♂	68	143	185	406	8.1	1,000	0	++	
32, ♀	51	15.8	160	287	6.0	2,000	0	0	
39, ♀	34	92	150	454	16.4	650	450	0	
41, ♀	51	86	130	1,065	41.0	500	450	++++	
Average, 594 cc., 14.6%									

17. Collier and Maddock,³ Nadal,⁶ Nesbit and Conger,²¹ White and Burton.²²

patient developed an alarming shock state from the operative trauma, blood loss and bile peritonitis and was given 3,000 cc. of blood in the next forty-eight hours, after which convalescence was relatively uneventful. Contrast this 41 per cent loss with that of case 21, in which a much larger amount of blood, 1,455 cc., was lost, the latter amount representing only 27 per cent of the total blood volume. Both cases required extensive replacement by blood. In operations of this character performed on undernourished and jaundiced patients, one should always plan on adequate replacement of the blood loss. The routine immediate replacement of blood in these patients was found to be inadequate at the

time of this study, and we have since planned for a liter of blood to be given during operation.

Table 6 presents studies of blood loss in 12 cases of cancer of the rectum treated by a single stage abdomino-

TABLE 6—Blood Loss During Combined Abdominoperineal Resection of the Rectum for Carcinoma

Case Number and Sex	Age	Weight, Lbs.	Duration of Operation, Minutes	Twelve cases		Intra venous Solution During Operation, Cc.	Blood Transfusion, Cc	Hypo tension
				Blood Loss	Total Volume, %			
7, ♀	69	128	107 *	183	4.1	1,200	450	++
13, ♀	55	150	180 *	410	9.0	2,000	0	+
17, ♂	68	128	145 *	523	11.6	1,000	450	0
18, ♀	61	128	185 *	519	13.5	1,200	450	0
23, ♂	49	107	200 *	474	13.3	1,000	450	+
24, ♂	70	125	235 †	686	15.5	1,200	300	+
26, ♀	60	116	110 *	247	7.1	1,100	450	++
30, ♀	48	158	245 †	494	10.4	1,000	450	+
34, ♀	73	126	156 †	225	5.5	950	450	+
36, ♀	64	138	85 *	483	11.6	1,000	450	0
38, ♂	75	167	185 †	375	6.3	1,100	450	+
42, ♂	48	142	160 †	306	6.1	1,400	450	+
Average, 410 cc, 9.5%								

* Spinal nupercaine. † Continuous spinal.

perineal resection. The losses in this group averaged 410 cc., the principal loss resulting from the perineal dissection. While this loss is not great it should always be replaced by blood, as so many of these patients are

TABLE 7.—Blood Loss During Operation for Complicated Gastric Lesions

Three cases, nitrous oxide and ether								
Case Number and Sex	Age	Weight, Lbs.	Duration of Operation, Minutes	Blood Loss		Intra-venous Solution During Operation, Cc.	Blood Transfusion, Cc.	Hypotension
				Amount, Cc.	Total Volume, %			
* 6, ♀	62	131	287	552	14.0	3,000	450 (and 400 plasma)	++
† 8, ♂	65	114	270	804	20.0	1,000	900	0
† 31, ♂	59	134	155	321	6.8	1,000	0	0
Average, 509 cc., 13.6%								

* Attempted total gastrectomy. Lesion frozen at gastroesophageal junction. Partial gastrectomy and gastrojejunostomy done.

† Total gastrectomy.

† Partial gastrectomy. Previous pyloroplasty.

malnourished, anemic and dehydrated (Milés regimen). The occurrence of hypotension in these patients (case 26) was thought to be of anesthetic origin. Table 7 presents three complicated gastric resections

TABLE 8—Blood Loss During Operations Involving Large Body Surfaces

Case Number and Sex	Age	Weight, Lbs.	Duration of Operation, Minutes	Three cases		Intra venous Solution During Opera tion, Cc.	Blood Trans fusion, Cc	Hypo tension
				Amount, Cc.	Total Volume, %			
* 12, ♀	35	105	158	1,257	39.9	2,250	900	0
† 19, ♂	58	192	210	1,397	20.6	1,500	900	0
† 33, ♀	60	125	120	857	22.9	900	450	0

* Resection of presacral chondroma. Anesthesia, nitrous oxide and ether.

† Exploration of large intrathoracic thyroid adenoma. Anesthesia, nitrous oxide and ether (intratracheally).

† Resection of large sarcoma of shoulder and hemiscapulectomy. Anesthesia: nitrous oxide and ether.

accompanied by a blood loss averaging 600 cc. In table 8 is shown the relatively large blood losses resulting from operation in which large body surfaces are opened. This blood loss is from multiple small rather

than from single large vessels. The use of gauze packs as hemostatic agents tends to obscure hemorrhage rather than control it. Table 3 is a similar example of operations on large body surfaces.

Concurrently with the blood loss determinations, observations were made of changes in hematocrit and hemoglobin and plasma protein concentration before and after operation. These findings are listed in relation to blood loss in table 9, and deductions from them agree with those of Stewart and Rourke.¹⁸ There was found no correlation between the amount of blood lost and the simultaneous changes in hematocrit, hemoglobin and concentration of plasma protein immediately before and

TABLE 9.—Blood Loss and Changes in Hematocrit, Hemoglobin and Plasma Protein During Operations

Case Number	Blood Loss		Hematocrit, Vol % R. B. O.		Hemoglobin, Gm %		Plasma Pro- teins, Gm. %	
	Amount, Cc	Total Volume, %	Pre Opera- tive	Post Opera- tive	Pre Opera- tive	Post Opera- tive	Pre- Opera- tive	Post Opera- tive
Radical Mastectomies								
1	827	12.6	43.3	42.3	15.0	12.7	7.21	6.73
25	670	15.8	43.9	41.7	13.6	12.9	7.04	6.56
27	924	17.8	47.2	44.6	15.6	13.3	7.25	6.66
29	520	14.6	42.3	37.6	13.2	10.7	7.66	6.50
40	1,001	25.8	45.7	44.8	13.3	11.6	6.24	7.72
Subtotal and Hemithyroidectomies								
2	234	8.3	34.5	34.2	12.1	11.7	6.40	6.25
3	276	7.5	48.4	43.5	15.6	14.0	7.28	6.73
9	409	9.1	41.6	38.7	11.6	11.3	7.35	7.28
10	204	5.3	46.2	43.4	14.8	13.8	6.70	6.22
13	389	6.0	54.4	51.2	12.7	12.7	7.38	7.33
16	725	27.6	41.4	41.2	13.1	12.7	7.14	7.17
20	688	26.4	39.3	39.0	12.4	11.7	6.53	6.32
37	92	2.9	32.4	44.4	10.2	13.3	7.07	8.10
Biliary Tract								
11	158	3.9	46.6	45.1	15.9	13.9	7.38	6.60
14	412	10.5	43.1	49.4	14.3	14.6	7.42	7.83
21	1,435	27.6	40.4	38.6	13.6	13.8	6.40	5.65
22	242	3.8	52.9	51.3	16.6	17.2	7.28	7.42
25	406	8.1	50.5	48.1	15.6	14.5	7.89	7.42
32	287	6.0	44.5	47.0	14.0	12.9	7.28	7.33
39	454	16.4	40.3	44.0	12.98	12.60	7.93	7.52
41	1,065	41.0	44.0	41.5	14.61	12.44	7.45	6.70
Combined Abdominoperineal Resections								
7	183	4.1	38.4	42.5	15.9	13.1	7.32	7.24
13	410	9.0	46.7	40.9	14.6	12.8	6.94	5.66
17	523	11.6	42.8	40.4	13.2	13.1	7.11	6.80
18	519	13.5	41.3	40.6	13.3	12.6	6.63	6.15
23	474	13.3	39.8	35.5	12.2	11.6	6.59	6.40
24	686	15.5	47.2	46.8	14.2	12.3	7.49	6.97
26	247	7.1	47.8	44.0	15.2	14.0	7.12	7.04
30	494	10.4	37.6	32.4	10.7	9.2	7.63	6.60
34	255	5.5	47.1	44.2	14.7	13.7	6.60	6.30
36	483	11.6	39.8	37.6	11.3	10.8	6.76	6.66
38	375	6.3	39.0	40.5	10.84	11.01	6.80	6.19
42	306	6.1	47.7	42.6	15.00	13.66	6.46	....

after operation. These determinations, therefore, cannot be used to estimate the need for blood volume replacement during and after operation. Obviously, it follows that if one wishes to know the amount of blood lost in any operation one must depend on direct measurement. This approach is not often practical, in which event one must rely primarily on a knowledge of average losses to provide a basis for the replacement of blood loss during operation. Additional blood may be given if the clinical state of the individual demands it. We believe that even minimal blood loss retards convalescence; that all loss over 300 cc. in healthy adults should be replaced and that all blood loss in operations on aged, undernourished, seriously ill or bedfast patients should be replaced with equal quantities of blood.

18 In table 9 the data were determined by use of the colorimeter described by K. A. J. Biol. Chem. 115:63, 1936; plasma protein determined by use of the Pregl, I.: Die Quantitative organische Mi. 1923

CONCLUSIONS

From this study we have drawn the following conclusions:

1. No correlation exists among the amount of blood lost and changes in hematocrit, hemoglobin and plasma protein concentrations before and after operation.
2. A knowledge of blood loss during operation as available in the literature offers a practical basis for planned transfusions during operation.
3. The patient is benefited most when the blood loss is replaced by blood, given as the loss occurs.

THE CLINICAL MANIFESTATIONS OF
LEPTOSPIROSIS IN LOUISIANA

HARRY A. SENEKJIE, M.D.
NEW ORLEANS

The classic description of infectious jaundice was presented by Weil¹ in 1886, who reported 4 cases in which there was a sudden onset of fever, chills, prostration, jaundice, hepatosplenomegaly, hemorrhagic tendency and renal failure. All 4 patients recovered. Inada and his associates² discovered the causative agent, and Noguchi³ named it *Leptospira icterohemorrhagiae*. Stimson⁴ described a spirochete in the organs of a patient in New Orleans who died presumably of yellow fever and called it *Spirochaeta interrogans*. Wadsworth⁵ introduced laboratory methods for the diagnosis of Weil's disease in the United States. Jeghers,⁶ Packhamian,⁷ Larson⁸ and others have reported numerous cases from this country.

Spirochetal jaundice is not a proper term, because jaundice is present only in about two thirds of the cases. Weil's disease refers to infection with *Leptospira icterohemorrhagiae*. *Leptospira canicola* infections occur in man and dog. In this country canine leptospirosis was reported by Meyer and his associates⁹ in California, by Molner and Kasper¹⁰ in Michigan, by Clara Raven¹¹ in Pennsylvania and by Bruno, Wilen and Snavey¹² in Louisiana; but Tiffany and Mar-

torana¹³ did not find any evidence of this infection in New York. The European *L. canicola* infections do not give rise to jaundice in human beings or dogs, but the American type may be icterogenic.

Vervoot, cited by Strong,¹⁴ found in cases of pseudodengue in Java a leptospira which he called *Leptospira pyrogenes*. This disease is endemic in plantations and may be associated with jaundice and rash. In southeastern Europe Tarassoff¹⁵ and Korthof¹⁶ reported a mild type of leptospirosis in which there was no jaundice. *Leptospira grippotyphosa* is the name given to the causative organism.

Leptospira hebdomadis is the causative organism of seven day fever, and *Leptospira autumnalis* is the causative agent of autumn fever in Japan.

Since leptospirosis is a general term which includes all the leptospiral infections, it is advisable to use specific terms, such as leptospirosis icterohemorrhagiae and leptospirosis canicola or canicola fever.

EPIDEMIOLOGY

Rat to rat transmission is accomplished through the contamination of the food by the excreta of the infected rats and less commonly through sexual intercourse among the rats. The incidence of infection is higher among the older than among the younger rats.

Rat to man transmission occurs mainly through the contamination of human food with the excreta of infected rats. Rarely a rat bite may be responsible for infection. The handling of rats is a frequent method of infection, so that the disease is found among sewer workers, harvesters, farmers, sugar cane cutters, fishermen, fish handlers, slaughterhouse employees and miners. Occasionally the infection is acquired by bathing in water contaminated with pathogenic leptospires. Dog to dog and dog to man transmission in canicola infection is similar to that of the rat borne leptospirosis.

In this series of 30 patients, the groups represented were cooks, gardeners, laborers, farmers, carpenters, porters, warehouse employees, truck drivers and orphans. In most of these cases there was a definite history of contact with rats and dogs.

INCIDENCE

The total hospital admissions to the Louisiana State Charity Hospital of New Orleans from September 1939 to February 1944 were 236,466, while the patients admitted to general medicine during this period were 37,610. During this period there were 28 cases of leptospirosis diagnosed by laboratory methods. Thus the ratio is 1 case of leptospirosis to every 8,445 general admissions and 1 case to every 1,343 general medicine inpatients.

Seven of the 30 patients were Negroes, and the only female in this series was a Negro woman. The age incidence varied from 14 to 68 years, but the majority of the patients were 20 to 40 years old.

The patients were admitted to the hospital from the second to the ninth day after the onset of the disease, but the majority were admitted on the fourth to the sixth day of the disease. The period of hospitalization

From the Department of Tropical Medicine, Tulane University of Louisiana.

Permission to study their cases, which are included in this report, was granted by Dr. John H. Musser, professor of medicine at Tulane University School of Medicine and senior visiting physician at the Charity Hospital in New Orleans; by Dr. Edgar Hull, professor of medicine at Louisiana State University School of Medicine and senior visiting physician at the Charity Hospital in New Orleans; by Dr. O. P. Daly, director of the Charity Hospital in New Orleans, and by Dr. F. C. Coleman of Toussaint Infirmary in New Orleans. Dr. Musser and Dr. E. C. Faust gave many valuable suggestions in the preparation of this paper.

1. Weil, H. A.: Ueber eine Eigentümliche mit Miltztumor, Ikterus und Nephritis Enitgerende akute Infektionskrankheit, *Deutsches Arch. f. klin. Med.* 29: 209, 1886.

2. Inada, R.; Ido, Y.; Hoki, R.; Kaneko, R. and Ito, H.: Etiology, Mode of Infection and Specific Therapy of Weil's Disease, *J. Exper. Med.* 23: 377, 1916.

3. Noguchi, H.: Nomenclature of *L. Icterohemorrhagiae*, *J. Exper. Med.* 27: 575, 1918.

4. Stimson, A. M.: A Note on an Organism Found in Yellow Fever Tissue, *Pub. Health Rep.* 22: 541, 1907.

5. Wadsworth, A.; Langworthy, V.; Stewart, C.; Moore, A., and Coleman, M.: Infectious Jaundice Occurring in New York State: Case of Accidental Infection of Human Subject with *Leptospira Icterohemorrhagiae* from a Rat, *J. A. M. A.* 78: 1120 (April 15) 1922.

6. Jeghers, H. J.; Houghton, J. D. and Foley, J. A.: Weil's Disease: Report of a Case with Postmortem Observations and Review of Recent Literature, *Arch. Path.* 20: 447 (Sept.) 1935.

7. Packhamian, A.: La spirochetose, *Bull. Office internat. d'Hyg. pub. et Etats-Unis* 1937, 1937.

8. Larson, C. L.: Weil's Disease in F. States, *Pub. Health Rep.* 56: 1650, 1941.

9. Meyer, K. F.; Stewart Anderson, B. and Eddie, B.: Epidemiology of Leptospirosis, *Am. J. Pub. Health* 29: 347, 1939.

10. Molner, J. G. and Kasper, J. A.: Outbreak of Jaundice in Detroit, *J. A. M. A.* 110: 2069 (June 18) 1938.

11. Raven, C.: Canine Leptospirosis in Pennsylvania, *J. Infect. Dis.* 69: 131, 1941.

12. Bruno, F. E.; Wilen, C. J. W., and Snavey, J. R.: Spirochaetal Jaundice: Report on Fifteen Cases Including Two Cases of *Leptospira Canicola* Infection, *J. A. M. A.* 123: 519 (Oct. 30) 1943.

13. Tiffany, E. J., and Martorana, N. I.: Leptospirosis in New York City, *Am. J. Hyg.* 36: 195, 1942.

14. Strong, R. P.: *Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases*, Philadelphia, Blakiston Company, 1943.

15. Tarassoff, S.: Sur la découverte de l'agent infectieux de la schlagm-fieber ou leptospirosis grippotyphosa aquatilis, *Ann. Inst. Pasteur* 46: 222, 1931; Trois eclosions d'épidémie de fièvre aquatique ou leptospirosis grippotyphosa aquatilis, 1932-1933, en U. R. S. S., *Bull. Office internat. d'hyg. pub.* 27: 683, 1935.

16. Korthof, G.: Experimentelles Schlagm-fieber beim Menschen, *Zentralbl. f. Bakt. (Abt. 1)* 125: 429, 1932; abstracted, *Trop. Dis. Bull.* 30: 17, 1933.

ranged from three to thirty-eight days. Four patients were hospitalized for three to nine days, 5 for ten to nineteen days, 8 for twenty to twenty-nine days and 11 for thirty to thirty-nine days. The duration of the fever ranged from eight to thirty-seven days. In 10 instances the duration of the fever was one to two weeks, in 5 two to three weeks, in 10 three to four weeks and in 4 four to five weeks. Three of the patients died in the second week and 2 in the fourth week of the disease.

CLINICAL FEATURES

Leptospirosis is a hepatorenal syndrome. In the anicteric cases the involvement of the liver is very slight, but there is always a mild hepatitis. In the majority of the cases there is a moderately severe hepatitis, and in some it is very severe. Similarly the kidney lesion may be very mild, moderate or very severe.

Icterus is due to partial biliary obstruction caused by inflammation of the biliary ducts. There is injury and damage of the hepatic cells, and this is a reversible phenomenon. Hemolysis does not play an important role in the causation of the jaundice. The renal lesion is of toxic origin and is primarily tubular. Hemorrhagic phenomena are a characteristic part of the clinical picture. They are apparently the result of the

TABLE 1.—Ratio of Leptospirosis Among Hospital Admissions

Year	General Admissions	General Medicine Admissions
1941.....	1 to 8,581	1 to 1,436
1942.....	1 to 4,909	1 to 725
1943.....	1 to 5,263	1 to 760
1939-1944.....	1 to 8,445	1 to 1,342

local toxic action of the leptospirae on the capillary endothelium and a deficiency of vitamin K due to liver dysfunction.

Septicemic Stage.—The incubation period of the disease varied from one to two weeks. The onset of the disease in 20 of the cases was sudden, with either a chilly sensation or a distinct chill, followed by fever, nausea, vomiting, arthralgia, myalgia, frontal headache, prostration, anorexia, diarrhea or constipation. Epigastric pain and discomfort, pain and tenderness in the muscles of the legs and back, as well as painful ocular movements, were very common. Infection of the upper part of the respiratory tract with cough and bloody sputum might simulate atypical pneumonia. The temperature of the patient varied between 101 and 104 F. The respiration was normal or rapid, the pulse was accelerated and there was a tendency to hypotension. Conjunctival injection was present in half of the cases. There was at times a mild injection, but in some cases severe hemorrhages took place. There were usually no hepatic or urinary disturbances, despite the fact that the fever continued to be high. Leptospirae occurred in the peripheral blood and were demonstrated on dark field examination, but there were no circulating antibodies. The duration of these symptoms was about three to seven days.

Hepatic, or Icteric, Stage.—The majority of the patients became icteric about the sixth to the seventh day after the onset of the disease. In a few cases jaundice developed as early as the second or third day and in some as late as the ninth day. According to Inada² jaundice appears in the middle of the first week.

according to Strasburger and Thill¹⁷ from the third to the ninth day, according to Martin and Pettit¹⁸ on the fifth day, and according to Ashe and his associates¹⁹ from the third to the ninth day. The onset of jaundice was very gradual. Clinically the first evidence was a subicteric hue of the scleras, which progressively became icteric. Two of our patients (6 2/3 per cent) were anicteric. Strong¹⁴ has stated that in Japan 60 per cent of the patients were icteric, while in Europe 13 to 58 per cent were anicteric. Larson⁸ reported 7 anicteric patients and inapparent icterus in 51 in the United States and Puerto Rico. The duration of this stage was seven to ten days in the series herein analyzed.

The liver was enlarged, tender and often painful. Usually it was about 2 fingerbreadths palpable, but rarely it reached the umbilicus. In 3 cases (10 per cent) the liver was not enlarged yet there was definite jaundice. In the 2 anicteric cases the liver was palpable. Hepatitis appeared to be present in both the icteric and the anicteric cases.

Splenomegaly was present in 3 cases (10 per cent). The spleen was soft and palpable 1 to 4 cm. below the costal margin. Clinically it resembled the splenomegaly of typhoid.

During this stage the gastrointestinal symptoms had a tendency to subside. Vomiting, arthralgia, myalgia and headache were not distressing, but the patient was toxic, apathetic and prostrated and had a continued fever. There was moderate abdominal distention due to low grade ileus and diminished peristalsis.

Hemorrhagic phenomena were present in 16 cases (53.3 per cent). Conjunctival injection, hemorrhages into the eye, petechial hemorrhages, ecchymotic spots in the skin and mucous membranes, epistaxis, melena, hematemesis, hemoptysis and bleeding from the gums were observed, but no demonstrable rashes were noticed.

With the appearance of icterus the pulse had a tendency to become slow. Pruritus occurred in 16 2/3 per cent of the patients, but herpes labialis was not observed. There was no generalized lymphadenopathy, but 4 patients (13.3 per cent) had palpable enlarged lymph nodes in the anterior cervical and inguinal regions, which were painless and subsided after recovery.

Respiratory Symptoms.—These were present in 12 instances (40 per cent). The following were observed: cough, expectoration, rarely blood tinged sputum, pharyngitis, bronchitis and at times patchy consolidation of the lungs. Not infrequently the clinical diagnosis of atypical or virus pneumonia was made in anicteric cases with the finding of blood tinged sputum. With the appearance of jaundice and later on the basis of the urinary findings, the presumptive diagnosis of leptospirosis was made.

Cardiovascular System.—The blood pressure was low. At times the heart was enlarged and hemic murmurs were detected. Gallop rhythm, tachycardia developing into bradycardia, premature beats, auricular fibrillation and flutter, pericardial friction rub and evidence of myocardial disease were also observed. The electrocardiogram revealed prolongation of the QT interval and PR interval, defective auriculoventricular

17. Strasburger, J., and Thill, O.: Klinik der Weilschen Krankheit. Mit Mitteilung von 2 neuerdings beobachteten Fällen, *Klin. Wchnschr.* 8: 1391, 1929.

18. Martin, L., and Pettit, A. A.: Présentation des préparations microscopiques et pièces anatomiques relatives à la spirochétose ictero-hémorragique, *Compt. rend. Soc. de biol.* 79: 659, 1916.

19. Ashe, W. F.; Pratt-Thomas, H. R., and Kumpe, C. W.: *Weil's Disease: A Complete Review of American Literature and an Abstract of the World Literature*, *Medicine* 20: 145, 1941.

conduction, functional or actual incomplete auriculo-ventricular block, low T waves, blocked auricular beats, sinus tachycardia, low voltage, with wide and slurred QRS complex. During convalescence the heart and the electrocardiographic findings gradually returned to normal.

Central Nervous System.—Headache, delirium, apathy, hallucinations, disorientation and restlessness were among the common observations. In severely ill patients there were rigidity of the neck and retraction of the head, loss of consciousness and symptoms of meningeal irritation. The following case is interesting from the point of view of the findings:

R. R., a white man aged 52, was admitted to the Charity Hospital on Aug. 7, 1943 with the complaint of headache, chills and fever since July 31 and the development of jaundice on August 5. He worked in a butcher's shop where there were many rats. On admission the temperature was 101 F., the pulse rate 115 and the respiratory rate 40. On August 8 he became irrational and incontinent, and gallop rhythm with a 200 per minute ventricular rate developed. On August 10 the neck became stiff and the patient was completely irrational. Leptospiras were observed in the blood and cerebrospinal fluid on the dark field examination. The pressure of the cerebrospinal fluid was 74, the color icteric, the cell count normal, the Pandy reaction 4 plus, proteins 57 mg. and chlorides 625 mg. per hundred cubic centimeters. All the agglutination reactions as well as the blood cultures were negative. The blood picture showed 4.95 million erythrocytes with 15.8 Gm. of hemoglobin, 27,800 white blood cells with 93 per cent polymorphonuclears. The urine had albumin (1 plus), no sugar and a specific gravity of 1.010, with numerous white and red blood cells and granular casts. The blood urea nitrogen level was 27.6 mg., icterus index 199.8, van den Bergh 40 units direct and the clotting time five minutes. The patient was given digitalis, infusions of dextrose, transfusions and other treatment but died on August 10, with a temperature of 107 F.

Leptospiras were demonstrated in the blood and urine by the dark field method. Agglutinins appeared in the blood but did not rise to diagnostic titer during the hepatic stage.

Nephritic, or Uremic, Stage.—The transition from the hepatic to the nephritic stage was gradual and not clearcut. Even during the septicemic stage there was some diminution in the urinary output, mild albuminuria and occasional red and white blood cells. During the hepatic stage there was oliguria, with red and white blood cells and occasional casts in the urine, but there was no retention of metabolites in the blood. Now symptoms of kidney failure became superimposed on those of hepatic failure, so that a state of cholemia and uremia resulted. The clinical diagnosis of Weil's disease was confirmed in a patient who had a sudden onset of fever with chills, arthralgia, myalgia, icterus and in whom kidney failure finally developed.

All patients had oliguria, while 5 (16⅓ per cent) had anuria. Albuminuria from 1 plus to 4 plus was present in 80 per cent of the cases, while glycosuria was present in 10 per cent. Red and white blood cells and hyaline or granular casts were present in 80 per cent of the cases. There was a steady rise in the blood pressure, a retention of nitrogenous metabolites, lowering of the kidney function tests (such as excretion of phenolsulfonphthalein) and fixation of the specific gravity of the urine but no hyperglycemia. The patient became irrational, restless and drowsy, with a continuous tendency to somnolence. There was disorientation as to time, place and person, and loss of sphincter control, so that the urinary output could not be measured. He became extremely toxic and semicomatose and finally died of uremia and hyperpyrexia. Lepto-

spiras could not be demonstrated in the blood, but they were found in the urine. The agglutinins rose to a diagnostic titer of 1:300 or above.

Convalescence.—In favorable cases the intensity of the jaundice and uremia gradually diminished, and there began to be secretion of more urine. The temperature began to fall by lysis, the hemorrhagic phenomena subsided and the patient became free from symptoms but suffered from general weakness for a few weeks. Ordinarily convalescence occurred in the third week, but it might be as late as the fifth or sixth week. The last symptom to disappear was jaundice, which at times persisted a few weeks after the temperature had become normal. In about 25 per cent of the cases in the third to the fifth week of the disease there was a relapse, which suddenly occurred with all the accompanying symptoms of the disease but was usually milder and lasted only two to seven days. Leptospiras were found in the urine, but the titer of the agglutinins in the blood was high.

LABORATORY DATA

Hematologic Observations.—The blood picture was one of microcytic hypochromic anemia. The blood count varied from normal to 1.81 million per cubic millimeter, with an average of about 3.5 million. There was occasionally a slight reduction in the platelet count. The bleeding and coagulation times were not altered. The prothrombin time was determined in 7 cases, and 6 showed moderate to considerable prolongation. The lowest was 40 per cent. The fragility of the erythrocytes was not altered. The sedimentation rate was increased. There was an active leukocytosis in 83 per cent of the cases, ranging from 10,000 to 30,000. In 6 instances the white cell count was within normal limits. There was a striking increase in the number of neutrophils with a shift to the left.

Blood Chemistry.—The van den Bergh reaction was direct. In the beginning of the disease the reaction was not intense, but progressively the icterus index and blood bilirubin levels reached as high as 300 units and 90 mg. per hundred cubic centimeters respectively. The blood chlorides, sugar and cholesterol were not altered. The blood urea and uric acid began to rise, and they reached their peak during the nephritic stage. Usually the urea nitrogen in the blood was around 50 mg., but the highest level in this series was 177 mg. per hundred cubic centimeters. The blood creatinine was determined at frequent intervals. Late during the course of the disease it rose to very high levels. Ten mg. per hundred cubic centimeters of creatinine was found to be a bad prognostic sign, and when the level reached 12 to 14 mg. the outcome of the infection was invariably fatal. The highest level in the present series was 17.8 mg. There was some evidence of reduction in the serum proteins. The carbon dioxide combining power of the plasma was normal or reduced. The hippuric acid test for liver function was reduced, and the cephalin cholesterol flocculation test was at times positive.

Urinary Observations.—The urinary output was diminished, and in the fatal cases there was anuria. Albumin, red and white blood cells, hyaline and granular casts, bile pigments and excess of urobilinogen were present. Glycosuria occurred in 10 per cent of the cases. The phenolsulfonphthalein excretion was reduced.

Stools.—Four patients (13.3 per cent) had clay colored stools.

COMPLICATIONS

Severe hemorrhages may be the usual features of the disease. Pneumonia, meningismus and meningitis are unusual. Multiple bacterial abscesses of the liver, myocarditis, iridocyclitis and optic neuritis have also been reported.

MORTALITY

Strong¹⁴ stated that in Japan the mortality rate is 48 per cent while in Europe it is 4 to 32 per cent. In this series the mortality rate was 16⅔ per cent. A white man aged 39 died on the eighth day of the disease; a Negro man aged 68 died on the twenty-seventh day of the disease; a white man aged 49 died on the thirteenth day; a white man aged 53 died on the eleventh day, and a white man aged 43 died on the twenty-fifth day of the disease. Patients may die at any stage of the disease, but young patients invariably recovered.

LABORATORY DIAGNOSIS

In 1939 laboratory methods for the diagnosis of Weil's disease were introduced in New Orleans. Since that time 45 patients have been admitted to the Charity Hospital with the probable diagnosis of Weil's disease, and 30 were found to have leptospirosis by diagnostic laboratory methods; hence 66⅔ per cent of the presumptive diagnoses were confirmed. In 1 case the diagnosis was Weil's disease on admission. In 5 other cases the admission diagnosis was catarrhal jaundice.

TABLE 2.—Summary of the Agglutinin Titers

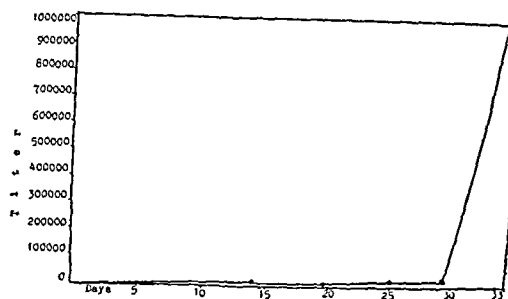
Cases	Titer
10.....	1:300 to 1:1,000
3.....	1:3,000
3.....	1:10,000
1.....	1:30,000
2.....	1:100,000
5.....	1:1,000,000

Multiple clinical diagnoses were given in every case, including pneumonia and atypical pneumonia, cholecystitis, hepatitis, typhus, typhoid, subacute bacterial endocarditis, abscess of the liver, yellow fever, acute yellow atrophy of the liver, nephritis, tularemia, meningitis, malaria, brucellosis, peripheral neuritis and avitaminosis.

The protean nature of the manifestations of leptospiral infections is well recognized. Therefore all clinical diagnoses must be proved by laboratory methods. During the septicemic and hepatic stages the blood is teeming with leptospires, and the dark field examination of the blood by an experienced investigator is the best diagnostic method. Schultz²⁰ observed pseudospirochetes arising from red blood cells, which can be easily mistaken for leptospires by an inexperienced worker. In this series 7 cases (23.3 per cent) were diagnosed by the finding of leptospires in the dark field. In 1 case the organisms were found as late as the tenth day after the onset of the disease. If the blood of the patients had been examined routinely during the early stages, the percentage would undoubtedly have been higher. In 1 case leptospires were found in the urine and in the cerebrospinal fluid in another case.

In 24 cases (80 per cent) the diagnosis was made by the agglutination reaction. The titer began to rise during the hepatic stage, reached the diagnostic level during the nephritic stage and was at its peak during

convalescence. In my opinion the diagnostic titer must be at least 1:300, with a steady rise in the titer. Amnestic reaction may be observed in persons who have residual agglutinins in the blood due to a previous clinical or subclinical infection and in whom a fever develops which is not related to leptospirosis. In such cases there may be an early rise in the agglutinin titer, with fall later on.



Agglutinin titers in a case of leptospirosis.

The following case report illustrates the way in which the agglutinin titer may remain at a low level during the course of the disease and then rise very rapidly toward the end, as shown in the accompanying chart.

J. Y., a white man aged 56, was admitted to the hospital on Jan. 12, 1942, the seventh day of his illness, with a tentative admission diagnosis of Weil's disease, catarrhal jaundice, yellow fever or acute yellow atrophy of the liver, because he was having chills, fever, nausea, vomiting, articular and muscular pains, headache, epigastric pain, jaundice, conjunctival injection, auricular premature beats, palpable anterior cervical lymph nodes, leukocytosis of 30,000 with 92 per cent neutrophils and 3.25 million erythrocytes, direct van den Bergh reaction and icterus index of 120 units, with urobilinogen and bilirubin in the urine. The blood pressure was 140/70; the blood urea nitrogen level was 37 mg. per hundred cubic centimeters; 0.22 Gm. of sodium benzoate was detoxified, and 50 per cent of injected bromsulphalein was excreted in five minutes, 0 in fifteen and 0 in thirty minutes. The duration of the disease was thirty-five days. The patient was hospitalized thirty-seven days.

Leptospira canicola infection was reported by Bruno and his associates.¹² The serum of these patients agglutinated *L. canicola* in 1:10,000 and 1:1,000,000

TABLE 3.—Important Data in Fatal Cases of Leptospirosis

Patient	Age, Yr.	Duration, Days	Levaditl	Agglutination	Dark Field
O. D.	39	8	—	—	—
A. T.	68	27	+	1:1,000,000	—
H. G.	49	13	—	1:300	—
R. R.	53	11	+	.....	+
J. O.	43	25	..	.....	+

dilutions respectively and *L. icterohemorrhagiae* in 1:1,000 and 1:1,000,000 respectively. There is no laboratory evidence that dogs in New Orleans suffer from canicola fever, even though jaundice is at times present in local dogs. Cultural methods and guinea pig inoculations were performed in some of the present cases, but the results have been consistently negative, even though young guinea pigs and large inoculums were used. Lately Lederle's slide agglutination antigen has been employed for the quick diagnosis of the disease, but it requires checking with the regular agglutination technic.

20. Schultz, E. W.: The Pseudospirochetes Derived from the Red Blood Cells, *J. Lab. & Clin. Med.* 8:375, 1923.

Leptospiras can be demonstrated by the Fontana stain in fluids and by the Levaditi stain in tissues. If the interval between death and preservation of the tissues for the silver stain is prolonged, the organisms may disintegrate. Table 3 shows the laboratory data in 5 fatal cases. Although a high agglutinin titer is usually a good prognostic sign, 1 patient (A. T.) died even though the titer was 1:1,000,000.

CLINICAL DIAGNOSIS

In New Orleans leptospirosis must be suspected in a patient who presents the following picture:

1. Sudden onset of chills, fever, arthralgia, myalgia, injection of the conjunctiva, hemorrhagic phenomena, leukocytosis.
2. Hepatomegaly and jaundice appearing on the fifth to seventh day; but anicteric cases must be considered.
3. Albuminuria, casts, kidney failure with the retention of metabolites in the blood.
4. A history of exposure to rats or of coming into contact with water or food which is polluted with the excreta of rats and possibly of dogs.
5. The finding of leptospiras in the blood or urine and agglutinins in the serum of the patient.

TREATMENT

It is claimed that the specific treatment of leptospirosis consists in the administration of hyperimmune horse serum which must have an agglutinin titer of 1:1,000,000 against *Leptospira icterohemorrhagiae* and *Leptospira canicola*. The dose is 60 cc. (Inada²¹). Inada and his associates,² Griffith,²² Pettit and his associates,²³ Zimmermann and Arjona²⁴ and Walch-Sorgdrager²⁵ have shown that when the serum is used early in the disease the mortality is lowered. In Japan the mortality rate dropped from 30.6 to 18.3 per cent. In this country Gaines and Johnson²⁶ used 30 cc. of convalescent serum, and Ashe and his associates²⁷ used 500 cc. of convalescent whole blood with good results. To be effective the convalescent serum must have a titer of 1:20,000. In the present series no hyperimmune horse serum was used. One patient received 250 cc. of convalescent whole blood in the fourth week of the disease, with no appreciable results.

All arsenicals are probably contraindicated, even though nearsphenamine has been used in some cases with questionable results.

Sazerac and Nakamura²⁷ used sodium bismuth tartrate intravenously in guinea pigs with favorable results. Uhlenhuth and Seiffert²⁸ used soluble colloidal bismuth chiniofon compound and reported good results. None of these drugs have been tried in the New Orleans series. Sulfonamides were administered in some of these cases, but they appeared to have no effect on the leptospiras. However, they are indicated when there is a bacterial complication.

Since hyperimmune horse serum and convalescent serum are not usually available and since the diagnosis of the disease is made late during the course of the infection, it is obvious that treatment must be symptomatic. The patients are given high carbohydrate, high protein and high vitamin diets to support the liver. Calcium gluconate is administered parenterally. The fluid intake of the patient must be adequate, so that fluids must be given by mouth, intravenously or by hypodermoclysis. Saline and dextrose infusions should be given frequently. When kidney failure becomes apparent the amount of dextrose must be increased, caffeine derivatives must be given in moderately large doses and hot applications or diathermy must be applied to the lumbar regions to encourage the secretion of urine. Mercurial diuretics are contraindicated. Small transfusions are helpful. Sedatives must be used when needed; cardiac tonics and stimulants are indicated when there is derangement of cardiac functions. During convalescence tonics, vitamins and iron should be administered.

PROPHYLAXIS

Wani²⁹ prepared a vaccine by treating emulsions of infected liver or cultures with 0.5 per cent phenol and refrigerating for seven days. Ten thousand two hundred and sixty-two miners were inoculated; they showed a morbidity of 0.3 per cent, while in the control, nonvaccinated, group the morbidity rate was 1.12 per cent. The serum of such persons protected guinea pigs against lethal doses of leptospiras. Van Thiel³⁰ used living avirulent strains of leptospiras which were maintained in cultures for eight years. He inoculated 5 persons with this strain. Four had atypical attacks, but the fifth manifested icterus. It is not advisable to use living leptospiras, since the factors which enhance the virulence of the organisms are not known. In the United States the disease is sporadic and there is no necessity for prophylactic inoculation.

SUMMARY

A clinical report on 30 cases of leptospirosis in Louisiana reveals that:

1. The incidence among the Charity Hospital inpatients from 1939 to 1943 was 1 case of leptospirosis to 8,445 general admissions and 1 case to 1,343 general medical admissions, while in 1943 it was 1 case to 5,263 general admissions and 1 to 760 general medical admissions.
2. Two patients had *L. canicola* infection.
3. The onset of the disease was sudden in two thirds of the cases, and icterus developed between the sixth and the seventh day after the onset of fever. Two patients were anicteric. The van den Bergh reaction was direct; the prothrombin time was prolonged, and hippuric acid excretion was reduced. In 10 per cent of the cases the liver was not enlarged even though jaundice was present. Splenomegaly was present in 10 per cent, hemorrhagic phenomena in 53.3 per cent and respiratory symptoms in 40 per cent of the cases. There was electrocardiographic evidence of cardiac lesions. All patients showed varying grades of pathologic changes in the kidneys, but 16⅓ per cent had anuria, 80 per cent had albuminuria, casts, red and white blood cells, 10 per cent glycosuria and 83.4 per cent had leukocytosis. The phenolsulfonphthalein excretion

21. Inada, R.: Prophylaxis and Serum Treatment of Spirochaetosis Icterohemorrhagiae, Japan M. World 2: 189, 1922.

22. Griffith, A.: Cultivation of *L. icterohemorrhagiae* and the Production of Therapeutic Spirochaetal Sera, J. Hyg. 18: 59, 1919.

23. Pettit, A., and others: Les spirochètoses, Bull. Office internat. d'hyg. pub. 29: 1023, 1937.

24. Zimmermann, E., and Arjona, E.: Serologischer Titer und Heilwert der Seren gegen Weilsche Krankheit, Ztschr. f. Immunitätsforsch. u. exper. Therap. 84: 111, 1934; abstracted, Trop. Dis. Bull. 32: 601, 1935.

25. Walch-Sorgdrager, B.: Leptospiroses, Bull. Health Organ., League of Nations 8: 143, 1939.

26. Gaines, A. R., and Johnson, R. P.: Weil's Disease: Report of Seven Cases, Arch. Int. Med. 60: 817 (Nov.) 1937.

27. Sazerac, R., and Nakamura, H.: Le bismuth dans la spirochètose, Presse méd. 1: 759, 1927.

28. Seiffert, W.: Untersuchungen über die Ausbreitung der Weilschen Krankheit bei Meerschweinchen unter der Behandlung, Zentrabl. f. Bakt. (Abt. 1) 114: 241, 1929.

29. Wani, H.: Ueber die Prophylaxe der Spirochaetosis icterohemorrhagica Inada durch Schutzimpfung, Ztschr. f. Immunitätsforsch. u. exper. Therap. 79: 1, 1933.

30. van Thiel, P. H.: Immunization Against Weil's Disease with Living Avirulent *Leptospira*, Geneesk. tijdschr. v. Nederl.-Indië 78: 1859, 1938.

was reduced, and there was elevation of blood urea and creatinine. The duration of the disease was three to six weeks, and the mortality rate was 16% per cent.

4. Sixty-six per cent of the suspected cases of leptospirosis were confirmed by laboratory methods. Seven cases (23.3 per cent) were diagnosed by the finding of leptospiras in the blood, 1 by their presence in the urine and 1 by their presence in the spinal fluid; in 2 fatal cases diagnosis was made by the Levaditi stain of sections of organs. In 24 cases (80 per cent) diagnosis was established by the agglutination reactions, in which the diagnostic titer ranged from 1:300 to 1:1,000,000.

5. The treatment was symptomatic, but 1 patient received 250 cc. of convalescent whole blood.

HYPERSENSITIVITY OF THE TUBERCULIN TYPE TO CRYSTALLINE PENICILLIN SODIUM

HENRY WELCH, PH.D.

AND

ADOLPH ROSTENBERG JR., M.D.

WASHINGTON, D. C.

In the limited number of reports that have appeared on the clinical use of penicillin sodium, urticaria seems to be the chief, if not the only, evidence of sensitivity to this drug. Keefer¹ reports 14 cases of urticaria out of 500 cases treated and Lyons² 12 cases of urticaria out of 209 treated. These reactions from commercial penicillin sodium, if predicated on a sensitization mechanism, are obviously not necessarily due to penicillin itself.

During the course of some studies designed to determine whether a correlation exists between the immediate local reactions obtained with certain lots of commercial penicillin sodium on intramuscular injection in man and those obtained by intracutaneous injection of the same material in rabbits and in man, a person, J. D. W., was injected intracutaneously in the left arm with four lots of commercial penicillin sodium representing the products of three different manufacturers. Each injection consisted of 0.05 cc. containing 1,000 units of penicillin. The subject had never been inoculated with penicillin previously but has worked with a variety of molds for the past fifteen years. Our investigations (about 200 intracutaneous injections in 12 people) indicate that most lots of penicillin sodium, on intracutaneous inoculation of 1,000 units dissolved in 0.1 cc. of water, produce within one to two hours an area of about 8 to 10 mm. of erythema and edema, while with some lots a small blister subsequently develops at the site of the inoculation. It therefore may be said that most commercial penicillin sodium is a mild primary irritant when injected intracutaneously. In contrast to this, crystalline penicillin has no primary irritating properties on intracutaneous injection, judging from 24 tests on 6 people. It is obvious, therefore, that the irritating properties of commercial penicillin sodium are from contaminants resulting as a by-product of its manufacture. None of the four skin tests in J. D. W. reacted during the first two hours. The first signs of a reaction occurred about six hours

after the intradermal tests had been made, at which time some redness and itching at the point of inoculation were noted. On observation twenty-four hours after injection, the erythematous areas had extended considerably and some infiltration was present. By the forty-eighth hour the points of inoculation had fused together into one large, erythematous, infiltrated, vesicular area. The reaction reached its peak between the forty-eighth and ninety-sixth hours, at which time the area measured 108 by 20 mm. and there was considerable exudation (fig. 1). Following the application of calamine lotion the area dried up, the superficial skin exfoliated and healing gradually took place.

Since commercial penicillin sodium is not a chemically pure compound it seemed possible that this person might be sensitive to some contaminating product resulting from the process of extraction. It is of interest that, of the three companies which produced the material injected into J. D. W., two produce penicillin by the deep tank process while the third uses the surface culture technic. All three companies use different methods of extraction.

In order to determine whether J. D. W.'s hypersensitivity was due to "penicillin" as such or to some contaminant resulting from the process of extraction,

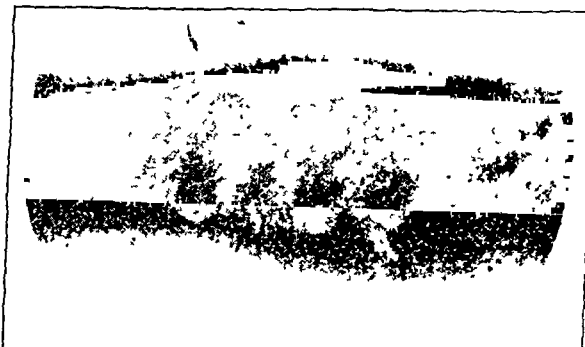


Fig. 1.—Ninety six hours after the first four intradermal tests with commercial penicillin sodium

he was given two intracutaneous injections of penicillin in the right arm; one, the crystalline product (1,650 units per milligram) and the other a commercial product. The latter was produced by the surface culture technic. Both injections consisted of 1,000 units of penicillin contained in a volume of 0.05 cc. of water. At the same time, similar injections were made into two other persons as controls. Observations after one and two hours showed no reaction in any of these three individuals. The following day (approximately twenty-four hours later) the controls showed no reaction as a result of the injection of either the crystalline or the commercial penicillin sodium, but J. D. W. exhibited a definite reaction to both products. The areas were erythematous and infiltrated, and each measured 15 mm. in diameter. Within forty-eight hours the areas had increased to 30 mm. in diameter (figs. 2 and 3).

It should be pointed out that, although the crystalline penicillin sodium is for all practical purposes a pure product, there might be associated with it minute amounts of contaminating material resulting from the process of extraction and not eliminated in crystallization. The fact, however, that the reaction obtained by the intradermal injection of the crystalline material elicited a reaction of approximately the same intensity as that produced by the injection of the commercial

From the Food and Drug Administration.
1. Keefer, C. S.; Blake, F. G.; Marshall, E. K., Jr.; Lockwood, J. S., and Wood, W. B., Jr.: Penicillin in the Treatment of Infections: A Report of 500 Cases. *J. A. M. A.* 122:1217 (Aug. 28) 1943.
2. Lyons, C.: Penicillin Therapy of Surgical Infections in the U. S. Army. *J. A. M. A.* 123:1007 (Dec. 18) 1943.

product would tend to obviate any minute amount of contaminating material as the primary cause of the reaction.

The course and clinical characteristics of the reaction exhibited to the intradermal injection of the penicillin had led us to believe that the hypersensitivity shown

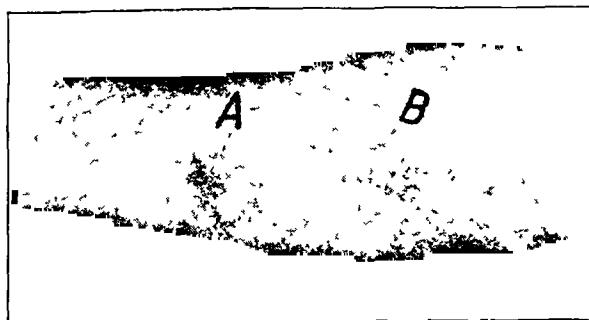


Fig. 2—Twenty four hours after intradermal tests with commercial penicillin sodium

by J. D. W. was of the "tuberculin" variety. But in order to determine whether there was any eczematous component, it was decided to perform patch tests on him. Two patch tests with a few drops of commercial penicillin sodium (assaying 4,000 units per cubic centimeter) were performed. One test was applied to the site at which the crystalline penicillin sodium had previously been injected and the other to the upper arm in a previously uninjected area. The site at which the crystalline penicillin sodium had been injected had apparently completely healed except for a faint tinge of redness. The patches were removed after forty-eight hours, and the one which had been applied to the area where the crystalline penicillin had previously been injected showed a sharply delineated erythematous infiltrated area (fig. 4), whereas the patch applied to the upper arm was completely negative.

In order to elucidate this phenomenon further, four patch tests were then applied to the subject's left arm; two were of commercial penicillin sodium (4,000 units per cubic centimeter) and two of the corn steep liquor medium normally used for the production of penicillin. One with each substance was applied to areas where

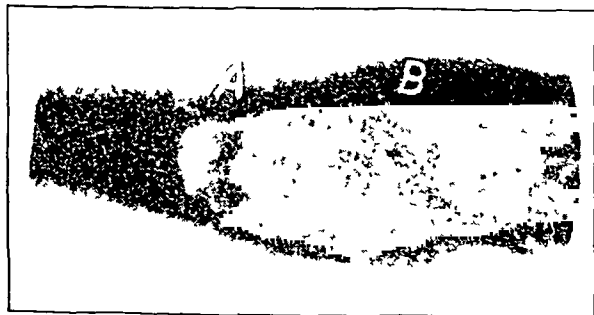


Fig. 3—Forty-eight hours after intradermal tests with crystalline penicillin sodium

previous penicillin injections had been made, and one with each substance to areas where no previous penicillin injection had been made. The areas where the penicillin sodium had previously been injected were, at the time of patch testing, apparently healed except for a faint residual tinge of redness. In order to be sure that neither the penicillin sodium nor the corn steep liquor medium was a primary irritant, these

substances were applied as patch tests to 4 persons who had not exhibited any reaction to penicillin sodium on intradermal injection. All tests were removed and read at the end of forty-eight hours. The penicillin sodium applied to the previously penicillin injected area (J. D. W.) gave a reaction identical to the one that he exhibited to the same test on the other arm, previously described. The test with the corn steep liquor medium gave a weakly positive reaction consisting of erythema and very slight infiltration, but this was quantitatively much less than the reaction manifested by the penicillin sodium. After ninety-six hours the patch test to the penicillin sodium was still positive, whereas that to the corn steep liquor medium had faded out. The patch tests applied to the upper arms as well as the tests applied to the controls were completely negative.

The serum of J. D. W. was tested for precipitins against 8 samples of commercial and one of crystalline penicillin sodium. True precipitation was not demonstrated. Although with some samples of penicillin a fine precipitate developed, this type of precipitate was demonstrated also with normal serum and was probably due to a chemical contaminant of these samples.

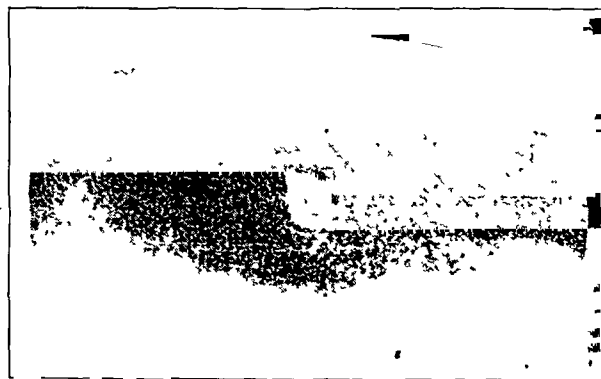


Fig. 4—Forty eight hour appearance of patch test applied to site of previous injection of crystalline penicillin.

Heterophile agglutinins were demonstrated in low titer (1:16) in J. D. W.'s serum. Since these agglutinins could be removed completely by adsorption with guinea pig kidney and not by adsorption with rabbit erythrocytes, they were classified as native rather than serum sickness agglutinins.³

In order to determine whether it was possible to transfer the sensitivity shown by J. D. W. to animals, 0.5 cc. of his serum was injected intradermally into two areas on the clipped abdomen of two rabbits. At the same time two 0.5 cc. amounts of a normal serum, obtained from a person (G. G. S.) who had never been injected with penicillin, were injected similarly. In the first rabbit, twenty-four hours later, 1,000 units of crystalline penicillin sodium was injected into two of the areas previously injected with serum (one injection in the area injected with G. G. S.'s normal serum and one injected in the area inoculated with J. D. W.'s serum). In the remaining two areas, commercial penicillin sodium was injected similarly. The second rabbit, which had been treated with these two serums, was injected with penicillin sodium in exactly the same manner forty-eight hours after the injection of the

3 Stuart, C. A.; Welch, H.; Cunningham, J., and Burgess, A. M. Infectious Mononucleosis (Further Studies), *Arch. Int. Med.* 58:512 (Sept.) 1936

serum. Following injection of the penicillin, the rabbits were observed for a period of three days. At no time during this interval did a reaction occur in the skin. Passive transference experiments were attempted in man. Six persons were injected intradermally in separate sites with 0.1 cc. of J. D. W.'s serum, 0.1 cc. of a normal serum (from an individual who had never been exposed to penicillin and who, on skin testing with crystalline penicillin, exhibited no cutaneous reactivity) and at a third site with 0.1 cc. of crystalline penicillin sodium containing 1,000 units. Twenty-four hours later, at the site of the previous injection of serums (both J. D. W.'s and control), 1,000 units of crystalline penicillin sodium in a volume of 0.1 cc. was injected. These six persons were kept under observation for three quarters of an hour and no reaction developed during this time or within the next twenty-four hours. Two of the subjects, however, C. W. P. and V. C., both of whom had had a number of previous intradermal injections of commercial penicillin sodium, showed reactions (erythema plus itching) at the site of these injections.

COMMENT

From a study of the reactions given by J. D. W. it appears that this person's hypersensitivity is definitely of the tuberculin type. Our reasons for stating this are (a) the lack of any immediate reaction to the intradermal injection of the material, (b) the fact that the reactions first became manifest approximately six hours after the intradermal introduction of the allergen and reached a maximum between twenty-four and forty-eight hours, (c) the fact that the reaction clinically consisted first of erythema, then infiltration and subsequently exudation, (d) the lack of demonstrable anaphylactic antibodies as evidenced by the negative precipitin tests and (e) the lack of demonstrable passive transference antibodies as evidenced by the failure to transfer the sensitivity to human volunteers.

It should be emphasized that as far as we were able to determine this person's sensitivity was to pure crystalline penicillin sodium. The crystalline material used was a portion of the master standard which has been established by the Food and Drug Administration for the assay of penicillin and as far as is known is a definite crystalline entity.

We are unable to state unequivocally the meaning of the positive patch test. Although clinically the reaction was of an eczematous nature and consonant with that seen in an eczematous hypersensitivity, it is difficult to explain the negative patch tests in J. D. W. when applied to normal skin. As far as we can see, the reason for the lack of reaction on the part of the normal skin could have been from one of two causes: (a) the eczematous hypersensitivity did not exist except in the areas that had previously been injected with penicillin or (b) the normal skin was less permeable than the areas that had previously been injected, so that the penicillin could not get to the eczematogenous shock tissue. It is possible, of course, that the positive patch test result in the lower arm was in a sense pseudo-positive in that it was not a reaction on the part of a hypersensitive epidermis but a reaction of the cells of the reticuloendothelial system in the cutis brought about by the transepidermal penetration of the allergen or, in other words, another demonstration of this individual's tuberculin type of sensitivity.

Ordinarily the tuberculin type of hypersensitivity indicates that the individual has had exposure to the

living agent. J. D. W. gives no history of an illness which we could reasonably state was due to *Penicillium* sp., but this man has been intimately exposed to molds of various kinds for the past fifteen years, so that it is not too unreasonable to assume that he has had a subclinical infection with *Penicillium* sp. or an immunologically related fungus, which has caused this alteration in his immune responses.

Preliminary unpublished observations in this laboratory indicate that various sensitization phenomena may develop fairly readily to penicillin in both man and animals. The experience with J. D. W. and these facts suggest that penicillin should be handled with caution, especially in its commercial production, in which intimate contact with large volumes of this drug and great numbers of spores cannot be avoided.⁴

SUMMARY AND CONCLUSIONS

1. A person was observed who exhibits a tuberculin type of hypersensitivity to crystalline penicillin sodium. The man had no prior exposure to penicillin.
2. However, he has had intimate contact with molds over a period of years.
3. The significance of such a hypersensitivity when the drug is to be used therapeutically is unknown.

PENICILLIN IN THE TREATMENT OF CAVERNOUS SINUS THROMBO- PHLEBITIS

RECOVERY WITH UNILATERAL ASCENDING OPTIC ATROPHY

W. M. NICHOLSON, M.D.

AND

W. B. ANDERSON, M.D.

DURHAM, N. C.

Until the advent of the sulfonamides cavernous sinus thrombosis or thrombophlebitis, infected with the staphylococcus, was universally fatal, but several instances of recovery under sulfonamide treatments have been reported.

We shall report in this paper an instance of cavernous sinus thrombosis, with staphylococcal septicemia, which was successfully treated with penicillin.

A detailed anatomic description of the cavernous sinuses and the clinical significance of their tributaries is contained in a paper by Grove.¹ According to this author, when a thrombophlebitis of the facial vein develops as a result of the injudicious incision of a furuncle of the upper lip, or the extraction of a hair from an infected follicle of the brow or nares, and this thrombophlebitis extends through the angular and ophthalmic veins to the cavernous sinus (the anterior route) the mortality is 100 per cent. Statistical studies, gathered from previous reports, which included cavernous sinus thrombosis as an extension of the thrombophlebitis from the lateral or the pterygoid sinuses, reveals a mortality of 90 per cent.

4. Since submission of this article a study of 140 unexposed persons indicates that approximately 5 per cent exhibit a tuberculin type of reaction to the initial injection of crystalline penicillin sodium.

From the Departments of Medicine and Surgery, Duke Hospital and Medical School.

The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigations recommended by the Committee on Chemotherapeutic and Other Agents of the National Research Council.

1. Grove, W. E.: *Septic and Aseptic Types of Thrombosis of the Cavernous Sinus*, Arch. Otolaryng. 24: 29 (July) 1936.

In 8 instances of cavernous sinus thrombosis studied at Duke Hospital, including 1 in which 10,000 units of penicillin was administered intravenously and 15,000 units by continuous intravenous drip during the twenty-four hour hospital stay, all the patients died. As late as 1937, MacNeal and Cavallo² could find records of only seven reported recoveries from acute thrombosis of the cavernous sinus.

However, the Wolfes³ report a recovery from an anterior focus (infected hair follicle) through the use of sulfathiazole.

Skemp, Afrenow and Rhoads⁴ also report a recovery from an anterior focus (infected hair follicle of brow) due to the use of sulfathiazole (149 Gm. in twenty-three days, at one time 21 Gm. per day). Schall⁵ cites three recoveries due to the use of sulfonamides by Barnshaw, Seydell and Pace.

The case here reported is of especial interest, particularly to ophthalmologists, in that we were able to observe the obliteration of branches of the retinal artery in association with engorgement of the retinal veins and a rapid atrophy of the optic nerve.

REPORT OF CASE

History.—A white farmer aged 30 was admitted on Oct. 31, 1943 in a semicomatose condition. Four days before admission he noticed a small furuncle in the right external naris. The following afternoon he received a smart blow across the bridge of his nose and later in the evening developed a severe pain in this area and severe bifrontal headache. The next morning, two days before admission, he had a hard chill, which was followed by high fever. At this time periorbital edema was apparent, and during the day it progressed to such an extent that he could not open his eyes. Thick yellow pus exuded from the right eye. The edema and redness extended from the bridge of the nose up over both frontal areas and down across both maxillae. The patient was given sulfadiazine while at home, in spite of which he continued to have chills and fever. On the morning of admission he became stuporous and could be aroused only by painful stimuli.

On admission, three days after onset, he presented the picture of an extremely ill person lying quietly in bed in a semicomatose state. There was bilateral exophthalmos with a pronounced swelling of the lids. The right upper lid could not be voluntarily retracted; the left could be retracted partially. A brawny, deep reddish purple swelling extended from below the mandible over the nose and cheeks well up to the hair line. The nose was remarkably swollen, being enlarged to more than twice its normal size (fig. 1). There was local elevation of temperature and much tenderness over the entire area. The right side of the face in all respects showed greater involvement than the left. The conjunctiva of the right eye was chemotic, the right eye more proptose than the left. Movement of the right eye was limited, but no paralysis was noted at this time. There was no involvement of the fundi at this stage of the disease.

The lungs were clear both to physical and to x-ray examination. Save for a loud systolic murmur over the apical region, the heart was normal. The remainder of the examination revealed nothing of interest.

Laboratory Studies.—Blood Kahn and Kline reactions were negative. Blood examination revealed 5,150,000 red blood cells, hemoglobin 160 Gm., 30,600 white blood cells, of which 89 per cent were segmented polymorphonuclears, 0 per cent stab cells, 0 per cent young forms, 0 per cent eosinophils, 0 per cent basophils, 1 per cent mononuclears, 5 per cent large lymphocytes and 5 per cent small lymphocytes.

Blood cultures on October 31 yielded two colonies of hemolytic *Staphylococcus aureus* per cubic centimeter, November 3 less than one colony of hemolytic *Staphylococcus aureus* per cubic centimeter, and November 5, 7 and 9 no growth.

In the urine November 1 albumin was 1 plus, and there was an occasional red blood cell and white blood cell in the sediment. November 6 there was a trace of albumin and an occasional red blood cell. Subsequent examinations of the urine gave normal results.

Course in the Hospital.—The patient had been given sulfadiazine before admission, and the concentration of sulfadiazine in the blood was 7.5 mg. per hundred cubic centimeters. During the next twelve hours he was given 3 Gm. of sulfadiazine intravenously and 4 Gm. by mouth, but despite this his condition grew worse. The edema and induration became so great as to make fundus examination impossible. It was decided that penicillin should be given, and he then received 10,000 units intravenously and 5,000 units subcutaneously. No further intravenous administration of the material was given, but the subcutaneous route was used throughout his hospital stay in dosages



Fig. 1.—Appearance of the patient three days after admission to the hospital. The face, eyelids and nose are edematous.

as shown in the chart (fig. 4). Since the differential showed a predominance of segmented forms of polymorphonuclear cells, staphylococcus antitoxin was not given.

No change in his condition was apparent until six days after admission, at which time he became rational and responded to questions. The swelling of his face was less, and the temperature had fallen considerably. He complained bitterly of a frontal headache, which was somewhat worse on the right.

His course from that time was one of steady improvement. By the fourteenth hospital day penicillin was discontinued, as the patient had been afebrile for twenty-four hours. However, on the nineteenth hospital day his temperature had risen to 38.5 C. (101.5 F.) and the headache, which had improved somewhat, became more severe. Penicillin was again given and continued for eight days. After two days he was relieved of his headache entirely, became afebrile, and his improvement became more pronounced. On the tenth day the swelling had subsided sufficiently to permit the use of the left eye. On the twelfth day the left lid was practically normal, the right still greatly swollen. On the twenty-second day of illness the right lid could be partially elevated. It was then discovered that vision in the right eye was limited to light perception.

2. MacNeal, W. J., and Cavallo, M. E.: Streptococcus Bacteremia and Afferent Thrombosis of the Cavernous Sinus with Recovery, J. A. M. A. 109: 2139 (Dec. 25) 1937.

3. Wolfe, C. T., and Wolfe, W. C.: Thrombosis of the Cavernous Sinus with Recovery, Arch. Otolaryng. 33: 81 (Jan.) 1941.

4. Skemp, H. I.; Afrenow, M. L., and Rhoads, P. S.: Thrombosis of the Cavernous Sinus with Staphylococci Septicemia Treated by Intravenous Injection of Sodium Sulfathiazole with Recovery, Arch. Otolaryng. 34: 1025 (Nov.) 1941.

5. Schall, L. R.: Treatment of Septic Thrombophlebitis of the Cavernous Sinus, J. A. M. A. 117: 581 (Aug. 23) 1941.

On the twenty-sixth day of the illness the sensorium had cleared and the condition of the patient was such as to permit a satisfactory ophthalmologic examination. Vision of the right eye was reduced to light perception. The left eye was apparently normal. The upper and lower lids were both puffy, the epider-

ischemia, secondary to the collapse of the arterial tree, the expression collapse being here used as best describing the appearance of the arteries. The inferior temporal artery also showed extensive perivascular sheathing, as did the other branches though to a lesser degree.

The patient was discharged from the hospital after thirty-eight days. There was total loss of vision in the right eye. Sight in the left eye was unimpaired. Otherwise there were no symptoms. Slight edema of the upper part of the face persisted, particularly over the right orbit and the bridge of the nose. Also over the nose small dilated veins could be seen (fig. 2). There was a paresis of the right superior rectus and a ptosis of the right lid. The fundi remained as described.

On Feb. 17, 1944, sixty-one days after discharge, the patient returned to the clinic. The small veins (the inferior palpebral arcade) beneath both eyes were considerably dilated, with some fullness of the veins over the temporal area. There was occasional frontal headache. Vision in the right eye remained limited to light perception.

The optic fundi were examined in detail. The left was normal. The right disk was slightly elevated. A pronounced pallor was already apparent. The sheathing of the arteries



Fig. 2.—Appearance at discharge from the hospital. There is still brawny edema over the bridge of the nose, pronounced dilatation of small veins over the nose, and ptosis of the right lid.

mis glazed and cracked and discolored a dusky brownish red. There was considerable bulbar chemosis bilaterally, the right being more pronounced than the left. The pupils were regular and equal and reacted to light. There was bilateral limitation of upward motion. The intraocular tension was not recorded. Ophthalmoscopic examination of the left fundus revealed a normal disk, macula and vascular tree. The right disk showed

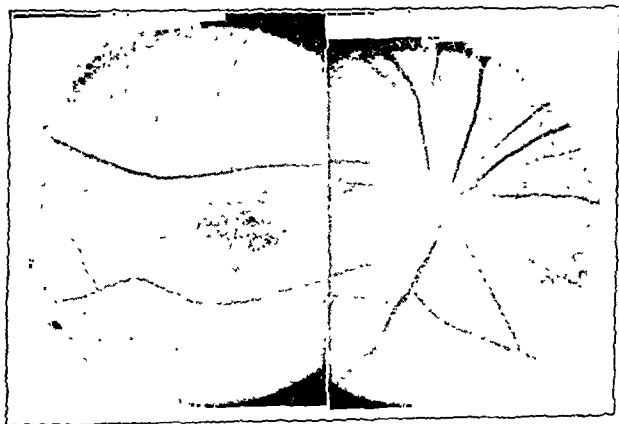


Fig. 3.—Right fundus five months after onset. The arteries are constricted; there is also retinal edema.

moderate swelling, with engorgement of the retinal veins and partial collapse of the arterial bed. There was a diffuse retinal edema, the macula being sharply outlined but not having the cherry red color suggesting occlusion of the central retinal artery. One received the impression, nevertheless, that the retinal edema and the accentuated macula were the result of

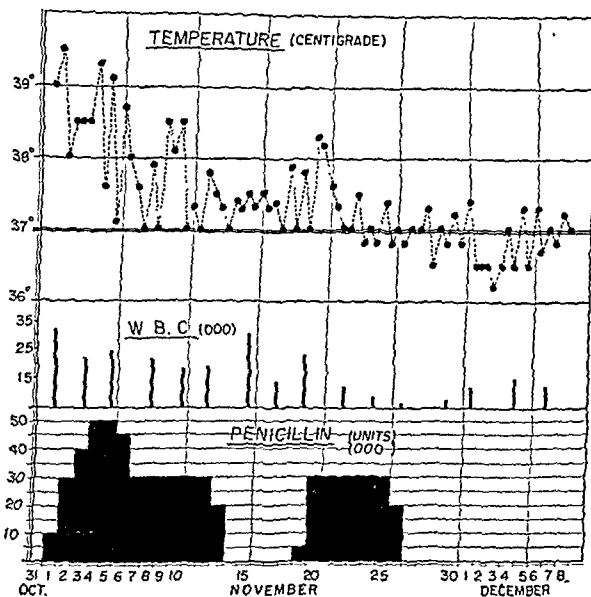


Fig. 4.—Temperature, white blood cells and penicillin therapy while patient was in the hospital.

noted previously was not so apparent but was present to an abnormal degree. The arterial bed was more constricted near the disk than in the areas between the first and second bifurcations. The macula reflex was normal. Retinal edema was not apparent with the ophthalmoscope but could be demonstrated by fundus photography.

The physical examination on this date was otherwise negative. The patient returned on March 21, approximately three months after discharge. Collateral superficial circulation about the lower lids in association with the temporal veins was more apparent. The bridge of the nose, the malar eminences and the median portion of the forehead appeared as a red mask, and slight magnification revealed a tremendous number of dilated interlacing venules.

The left fundus was again found to be normal; vision 20/20. Vision in the right eye was limited to light perception. The disk showed great pallor with minimal gliosis. The macula appeared normal and the veins appeared normal in size and color. The arteries continued to show the great constriction noted previously. The perivascular sheathing of the arteries was not so prominent but was present. The arteries continued to show the greater constriction near the disk. Figure 3 is a fundus photograph on this date showing this abnormality in the caliber of the arterial tree. Some retinal edema still persisted.

COMMENT

Two questions arise:

1. Was the diagnosis correct?
2. What is the explanation for the constriction of the arterial tree and the optic atrophy?

As proof of the accuracy of the diagnosis in this case (1) there is the history of the furuncle in the lateral nasal wall with the secondary insult resulting from the sharp blow over the nasal bridge; (2) after a short incubation period there is the onset of general malaise, chills and increased temperature; (3) there is the definite bacteremia, staphylococci being recovered on two occasions from the blood stream; (4) there is the bilateral exophthalmos, chemosis of the conjunctiva, edema of the face and dusky red discoloration of the skin as evidence of venous obstruction and, finally, there is (5) the profound stupor.

The increased perivascular sheathing of the proximal portions of the retinal artery, with constriction in these portions, and papilledema followed by secondary atrophy is difficult to explain. As a matter of fact no thoroughly satisfactory explanation has been offered as to why cavernous sinus thrombosis, proved at autopsy, can occur without papilledema. The explanation that the central retinal vein may empty into one of the ophthalmic veins rather than the cavernous sinus seems inadequate. The elder Stocker in 1906 suggested that papilledema in cavernous sinus thrombosis is uncommon because the arterial pressure in the eye is, at least in some cases, reduced by the increase in venous pressure coincident with the venous obstruction. In this particular case we feel that there was impediment to the arterial circulation, definitely more than would be expected by the relatively mild papilledema. The sheathing of the arteries suggested an inflammatory reaction in the arterial wall. This inflammatory reaction could have extended directly along the artery from the sinus, since it is here that the artery comes in closest contact with the infected focus; or the apparent inflammatory reaction, with constriction most pronounced in the proximal portions of the arterial tree, may have been due to the irritation of the sympathetic plexus in the carotid sheath in the sinus.

In any case it is probable that the atrophy was secondary to embarrassment of the arterial circulation with ischemia and later edema of the retina; in other words, an ascending degeneration.

CONCLUSIONS

The efficacy of penicillin as a therapeutic agent is further demonstrated when used in cavernous sinus thrombosis.

Optic atrophy, resulting from cavernous sinus thrombosis, may be the result of an ascending degeneration secondary to constriction in the central retinal artery with ischemia of the retina, due either to arteritis or to irritation of the sympathetic plexus in the sinus

Founder of British Dermatology.—Robert Willan (1757-1812) of London is the accepted founder of British dermatology, who marks the beginning of modern dermatology. In 1785 he presented a plan for the classification of skin diseases before the Medical Society of London, which five years later was given the Fothergillian medal; Jenner received the same medal a few years later—Pusey, William Allen. *The History of Dermatology*, Springfield, Ill., Charles C Thomas, 1933

NONSPECIFIC MAJOR OPERATIONS AND
LUMBODORSAL SYMPATHECTOMYA COMPARISON BETWEEN THEIR EFFECTS ON
THE BLOOD PRESSURE

FRANCISCO ROJAS, M.D.

SANTIAGO, CHILE

R H SMITHWICK, M.D.

AND

PAUL D. WHITE, M.D.

BOSTON

The surgical treatment of hypertension by sympathetic resection has met many objections in the last few years. One of these concerns the specific value of sympathectomy in the reduction of blood pressure in the patients who have undergone operation.

In 1939 Volini and Flaxman¹ followed the course of the blood pressure of 17 hypertensive patients oper-

TABLE 1—General Data

Group 1 Nonspecific operations	
Number of cases	100
Males	13
Females	87
Mean age	50 years and 3 months
Group 2 Lumbodorsal sympathectomy	
Number of cases	100
Males	40
Females	60
Mean age	41 years and 3 months

TABLE 2—Immediate Effect of Operation

	No Results	Moderate Reduction	Pronounced Reduction
Group 1 Immediate reduction (up to 6 months after the operation)			
Systolic pressure	49%	49%	2%
Diastolic pressure	60 3%	27 1%	12 6%
Group 2 Immediate reduction (10 days after the second stage of the operation)			
Systolic pressure	3 3%	24 4%	72 3%
Diastolic pressure	8 8%	37 7%	53 5%

ated on for different reasons not related to their hypertension. They observed in almost every case a decided reduction of the blood pressure after the operation. They arrived at the conclusion that the blood pressure reduction attributed to nerve resection was actually due to the general conditions to which every patient who is operated on is subjected: bed rest, anesthesia, sedatives, operative shock and special diet. On these bases they denied the specific effect of sympathetic nerve resection on hypertension.

In September 1943 Adamson and Dubo² arrived at a similar conclusion. Following the course of the blood pressure of 58 hypertensive patients submitted to various major operations during eight to ten days after the operation was performed, they observed a reduction of the systolic blood pressure, which was, on the average, 29 per cent of the blood pressure prior to the operation. Comparing this figure with the 28 per cent of systolic blood pressure reduction reported by

Read before the New England Heart Association, Jan. 31, 1944.

1. Volini, I. F., and Flaxman, N.: Effect of Nonspecific Operations on Essential Hypertension, *J. A. M. A.* 112: 2126-2128 (May 27) 1939.
2. Adamson, J. D., and Dubo, S.: The Effect of Surgical Operations on Blood Pressure, *Canad. M. A. J.* 49: 161-166, 1943.

Crile³ after celiac ganglionectomy, they concluded, as Volini and Flaxman had done, that the results of sympathetic operations are not specific and can be observed after any major operation.

With the purpose of checking these opinions, we have reviewed the records of hypertensive patients admitted

TABLE 3.—Condition Six or More Months Later

	No Results	Moderate Reduction	Pronounced Reduction
Group 1. Late reduction (more than 6 months after the operation; average period of observation, 10 months)			
Systolic pressure.....	82.7%	17.3%	0%
Diastolic pressure.....	86%	14%	0%
Group 2. Late reduction (more than 12 months after the second stage of the operation; average period of observation, 20 months)			
Systolic pressure.....	9.6%	28.1%	62.3%
Diastolic pressure.....	7.6%	36.1%	56.3%

to the Massachusetts General Hospital during the last ten years who were submitted to different major operations, in particular hysterectomy, mastectomy, gastrectomy and thyroidectomy. We have studied 100 cases in which the blood pressure readings were adequate for our purpose.

On the other hand, we have studied the reduction of blood pressure in 100 hypersensitive patients submitted to bilateral lumbodorsal sympathectomy by the procedure of Smithwick,⁴ performed in two stages but otherwise unselected. Some of these records were taken from the files of the Massachusetts General Hospital, and others from the private files of one of us (R. H. S.). The general data concerning the patients are summarized in table 1.

We have summarized in table 2 the immediate effect that the operations had in both groups. We have considered as "no results" reductions of less than 5 per cent of the initial systolic or diastolic blood pressure, "moderate" the reductions between 5 and 25 per cent and "pronounced" the reductions over 25 per cent of the blood pressure prior to the operation. As shown in table 2, even the immediate reduction of blood pressure is quite different in the nonspecific and the specific operation groups. Six or more months later this difference is still more evident, as summarized in table 3.

TABLE 4.—Reduction of Blood Pressure After First Stage and After Second Stage of Lumbodorsal Sympathectomy

	No Results	Moderate Reduction	Pronounced Reduction
Results 10 days after first stage of lumbodorsal sympathectomy			
Systolic pressure.....	30%	64%	6%
Diastolic pressure.....	42%	44%	14%
Results 10 days after second stage of lumbodorsal sympathectomy			
Systolic pressure.....	3.3%	24.4%	72.3%
Diastolic pressure.....	8.8%	37.7%	53.5%

We have also made a comparison of the reduction of blood pressure observed after the first stage with that after the second stage of lumbodorsal sympathectomy. The first stage of this operation can be considered like any major operation. It lasts one to one

and a half hours and is performed under general anesthesia. If the sympathetic resection has no specific effects, there should be no reason for a difference between the two stages of the operation. We have summarized in table 4 the results of this comparison.

Observing the figures in table 4, it is reasonable to conclude that the blood pressure reduction obtained by the first stage of lumbodorsal sympathectomy is quite similar to that observed after any other operation. It is not until the second stage is performed that a real reduction of blood pressure is observed.

As a final indication of the specificity of the sympathetic operation, we have summarized in table 5 the

TABLE 5.—Blood Pressure of Patients Who Had Another Operation Besides Lumbodorsal Sympathectomy

Patient	Blood Pressure
1. M. G.	3/23/43..... 190/120
Ovarietomy	3/24/43..... 200/90
4/ 7/43.....	
Lumbodorsal sympathectomy	6/21/43..... 150/90
7/10/43.....	
2. M. B.	12/13/29..... 150/90
Cholecystectomy	12/16/29..... 224/114
4/13/41.....	
Lumbodorsal sympathectomy	6/ 3/41..... 140/80
6/28/41.....	
3. L. A.	11/ 4/42..... 240/100
Right lumbodorsal sympathectomy	11/14/42.....
Cholecystectomy	11/28/42..... 210/110
Left lumbodorsal sympathectomy	12/26/42..... 170/90
12/28/42.....	
4. I. T.	8/26/43..... 200/110
Thyroidectomy	8/27/43..... 180/90
8/29/43.....	
Lumbodorsal sympathectomy	9/25/43..... 130/90
10/14/43.....	
5. N. M.	5/10/43..... 160/100
Right lumbodorsal sympathectomy	5/13/43.....
Cholecystectomy	5/25/43..... 170/100
6/ 5/43.....	
Left lumbodorsal sympathectomy	6/19/43..... 120/80
7/13/43.....	
6. M. L.	5/30/38..... 190/120
Hysterectomy	6/ 8/38..... 186/120
9/18/38.....	
Lumbodorsal sympathectomy	10/ 5/38..... 140/100
10/15/38.....	

blood pressure data of a certain number of patients who have had, in addition to the lumbodorsal sympathectomy, another operation performed before or in the interval between the two stages of the sympathectomy.

SUMMARY AND CONCLUSIONS

This study has shown that nonspecific major operations, as studied in 100 patients, produce some immediate reduction of the blood pressure of hypertensive patients, as has been reported in previous papers. However, this reduction is not pronounced and in the great majority of cases persists for only a short time. On the contrary, lumbodorsal sympathectomy by Smithwick's technic, as studied in a second group of 100 cases, produces in the majority a pronounced reduction of

3. Crile, G.: Two Years' Results of Treatment of Essential Hypertension by Celiac Ganglionectomy. *Cleveland Clin. Quart.* 6: 42-52, 1939.
4. Smithwick, R. H.: Technique for Sympathetic Resection for Hypertension: Preliminary Report, *Surgery* 7: 1-8, 1940.

blood pressure which is still present after a considerable period of observation. The specificity of this operation is also demonstrated by the fact that definite results are not observed until after the second stage operation has been performed, the first stage producing about the same effect as any other major operation. Finally, the fact that in patients in whom major operations were performed in addition to lumbodorsal sympathectomy a pronounced and lasting reduction of blood pressure is not observed until the sympathetic resection is performed is further evidence of the fact that lumbodorsal sympathectomy has a specific effect in reducing blood pressure.

Massachusetts General Hospital

INFECTIOUS HEPATITIS IN THE MIDDLE EAST

A CLINICAL REVIEW OF 200 CASES SEEN IN A
MILITARY HOSPITAL

CAPTAIN WALTER P. HAVENS JR
MEDICAL CORPS, ARMY OF THE UNITED STATES

Within the past two or three years infectious hepatitis has become recognized as an epidemic disease of increasing military importance.¹ Its prevalence among British troops in the Middle East has been high,² but it has not been limited to British forces or to that particular geographic area, for this disease has occurred in the armies of other allied nations; in the French army in Tunisia,³ in the Italian army in Sicily in 1941⁴ and in the German army⁵ as well as in the civilian population of Palestine.⁶ Outbreaks of what may be the same disease have also occurred in the civilian population of Scandinavia,⁷ England⁸ and America,⁹ but in the absence of diagnostic tests the relationship of infectious jaundice to so-called catarrhal jaundice¹⁰ as well as to various types of "epidemic jaundice"

(with the exceptions of yellow fever and Weil's disease) is not clear.¹¹ Furthermore, the question has arisen as to whether the types of hepatitis following the inoculation of human serum¹² (icterogenic serum) and yellow fever vaccine¹³ are the same and thus represent artificial examples of infectious hepatitis. In view of these obscurities, it will not be the function of this paper to review the literature or to consider the pathogenesis and epidemiology of infectious hepatitis. My object in the present report has been to assemble data on the clinical picture of this disease as seen in a group of patients diagnosed as having infectious hepatitis (and infectious cholangitis) at an American military hospital in the Middle East during the years of 1942 and 1943.

CLINICAL MATERIAL AND METHODS

The patients described in this paper had contracted their disease in various sections of the Middle East, North Africa and the eastern Mediterranean area including Sicily and Italy. In these areas the disease had been endemic in British and American troops throughout the year, but there was a sharp rise in prevalence beginning in late October and receding during the winter months. Actual dates of admission to the hospital by months appear in chart 1.

For the clinical analyses the pertinent data were assembled from 200 hospital case histories on a master chart. All histories were included from patients on whom the diagnosis of infectious hepatitis (or infectious cholangitis) was made during the period of Nov. 11, 1942 to Feb. 1, 1944. For purposes of convenience and clarity of description the clinical course of the disease was divided when possible into two phases: the preicteric phase, starting with the onset of symptoms, and the icteric phase, starting with the time when the patient first noticed that his urine was dark and terminating when the serum icterus index reached approximately normal levels.

A definite preicteric phase was presented by 167 (83.5 per cent) of 200 patients, while the remaining 33 patients (16.5 per cent) presented jaundice as the first complaint without any preceding symptoms. The latter group was included in the description of the icteric phase. All patients were men of an average age of 25.5 years, ranging individually from 19 to 52 years, although there were only 3 who were older than 40 years of age.

From the Medical Division, General Hospital
Assistance in the collection of clinical material was given by the following medical officers: Lieut. Col. Robert B. Nye, M. C.; Major Edgar Dessen, M. C.; Capt. Edward Tallant, M. C.; Capt. Albert Maisel, M. C.; and Capt. John Stone, M. C.

This work was carried out under the direction of the Surgeon on Neurotropic Virus Diseases of the Board of Control of Infectious and Other Epidemic Diseases, Medical Service, Office of the Surgeon General, U. S. Army.

1. Epidemic Hepatitis or Catarrhal Jaundice, editorial, J. A. M. A. 123: 636-637 (Nov. 6) 1943. Infective Hepatitis, Bull. War Med. 3: 394-395 (March) 1943.

2. Van Rooijen, C. E., and Gordon, I. Some Experimental Work on Infective Hepatitis in the Middle East Force, J. Roy. Army M. Corps 79: 213-225 (Nov.) 1942. Cameron.¹⁴

3. Senevet, G., Montrier, P., Gros, H., Alcaï, L., and Bougarel, R. A propos de l'ictère de Tunisie, Arch. Inst. Pasteur d'Algérie 19: 47-63 (March) 1941.

4. di Benedetto, J. Contributo alla conoscenza dell'epatite epidemica fra le truppe in Sicilia, Settim. med. 30, no. 50, 1942.

5. Siegmund, H. Zur pathologischen Anatomie der Hepatitis epidemica (zugleich ein Beispiel für die Grenzen der anat. Pathologie), München med. Wchnschr. 89: 463 (May 22) 1942. Gutzeit, K. Icterus infectiosus, ibid. 89: 161 (Feb. 20), 185 (Feb. 27) 1942. Dietrich, S. Der sogenannte katarrhalische Icterus und die Hepatitis epidemica, Deutsche med. Wchnschr. 68: 5 (Jan. 2) 1942.

6. Infectious Hepatitis in Palestine, Foreign Letters, J. A. M. A. 123: 1062 (Dec. 18) 1943. Jossem, J. On the Problem of Endemic Jaundice (Icterus Endemicus), Harefuah, October and November 1940, vol. 19, English summary, November 1940, p. 31, Bull. Hyg. 16: 273 (June) 1941.

7. Stuhlfauth, K. Epidemic Jaundice Group Outbreak Amongst Soldiers and Civil Population in Norway, Bull. War Med. 3: 213 (Dec.) 1942, abstracted, Deutscher Militärarzt 5: 591-602 (Oct.) 1941.

8. Lord, J. C. Infective Hepatitis (Epidemic Catarrhal Jaundice). Three Hundred Cases in Outer London Borough, Lancet 1: 675 (May 29) 1943. Edwards, L. R. H. Outbreak of Epidemic Catarrhal Jaundice, Brit. M. J. 1: 474-475 (April 17) 1943. Follows, A. B. Epidemic Catarrhal Jaundice, M. Officer 63: 23-24 (Jan. 20) 1940.

9. Rogers, O. F. Epidemic Hepatitis, Correspondence, J. A. M. A. 123: 1066-1067 (Dec. 18) 1943. Norton, J. A. Acute Infectious Jaundice, ibid. 113: 916-917 (Sept. 2) 1939. Molner, J. G., and Kasper, J. A. An Outbreak of Jaundice in Detroit, ibid. 110: 2069 (June 18) 1938.

10. Wolter, F. Der sogenannte "epidemic jaundice" (Eppinger) und die Hepatitis epidemica mit ihren Verhältnissen zum Icterus catarrhalis, Wchnschr. 68: 558 (May 29) 1942. Dietrich.⁵

11. Problem of Infectious Jaundice, editorial, J. A. M. A. 122: 1186-1187 (Aug. 21) 1943.

12. McNulty, A. S. Acute Infectious Jaundice. Measles Serum, in Annual Report of the Chief Ministry of Health for the Year 1937, London.

Office, 1938. Sergiev, P. G., Tarcev, E. M., Gontareva, A. A.; Lyschitz, I. M.; Savinski, G. N.; Trofimovski, M. A., and Zimmerman, A. N. Virus Jaundice Epidemic Hepatitis in Relation to Immunization with Human Serum, Terap. Arkh. 18: 595-611, 1940. Homologous Serum Jaundice, Memorandum Prepared by Medical Officers of Ministry of Health, Lancet 1: 83-88 (Jan. 16) 1943. Infective Hepatitis and Serum Jaundice, editorial, Lancet 1: 683 (May 29) 1943. Probert, A. S. Hepatitis After Prophylactic Serum, Brit. M. J. 2: 677 (Sept. 24) 1938. Morgan, H. V., and Williamson, D. A. J. Jaundice Following Administration of Human Blood Products, ibid. 1: 750-753 (June 19) 1943.

13. Findlay, G. M., and MacCallum, I. O. Hepatitis and Jaundice Associated with Immunization Against Certain Virus Diseases, Proc. Roy. Soc. Med. 31: 799-806 (May) 1938. Soper, I. L., and Smith, H. H. Yellow Fever Vaccination with Cultivated Virus and Immune and Hyperimmune Serum, Am. J. Trop. Med. 18: 111-134 (March) 1938. Fox, J. P., Manso, C.; Penna, H. A., and Madureira, Para. Observations on the Occurrence of Icterus in Brazil Following Vaccination Against Yellow Fever, Am. J. Hyg. 36: 68-116 (July) 1942. Jaundice Following Yellow Fever Vaccination, editorial, J. A. M. A. 119: 1110 (Aug. 1) 1942. Findlay, G. M., and Martin, N. H. Jaundice Following Yellow Fever Immunization, Lancet 1: 678-680 (May 29) 1943. Turner, R. H., Snively, J. R.; Grossman, E. B.; Buchanan, R. N., and Foster, S. O. Some Clinical Studies of Acute Hepatitis Occurring in Soldiers After Inoculation with Yellow Fever Vaccine with Especial Consideration of Severe Attacks, Ann. Int. Med. 20: 193-218 (Feb.) 1944. Oliphant, J. W.; Gilham, A. G., and Larson, C. L. Jaundice Following Administration of Human Serum, Pub. Health Rep. 58: 1233-1242 (Aug. 13) 1943.

CLINICAL COURSE OF THE DISEASE

In chart 2 a diagram has been composed to show the clinical picture of a typical average case of the disease which is to be described in this paper. The preicteric phase, when present, ranged in length from one to eighteen days, with an average of five days, and mani-

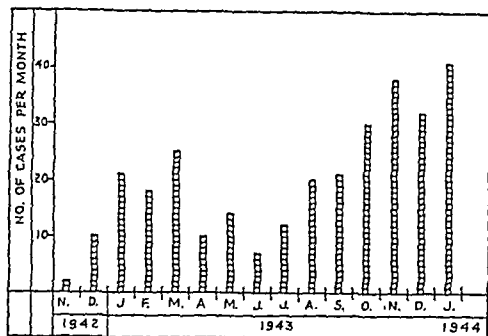


Chart 1.—Seasonal variation in the admission rate of American troops with infectious hepatitis to an American general hospital in the Middle East from Nov. 11, 1942 to Feb. 1, 1944.

festated all grades of severity from the mildly sick to the severely prostrated patient.

The most common symptom in the preicteric phase of the disease was anorexia, which began insidiously and which was usually the first complaint. This early loss of appetite was particularly noticeable in the field, where rations were monotonous, and such early aversion to food was often observed by the group medical officer as beginning evidence of disease before the patient felt actually sick. Nausea soon became evident after meals, and although vomiting was less common it frequently occurred later in the preicteric phase just before the onset of jaundice. In the ensuing few days many men complained of weakness and described it as lack of energy to perform duty and disinterest in work. Members of the Air Force in particular noted lack of

sensation in the left upper quadrant. Palpation of the upper abdomen in these cases in the preicteric phase frequently elicited tenderness, although rarely was the liver or spleen palpable. Disorders of bowel function were not common; constipation occurred more frequently than diarrhea.

In approximately one half of the 167 patients manifesting a preicteric phase, the onset was sudden with frank chill or chilliness, fever, malaise, headache and generalized aches and pains. In general the temperature was remittent, with a daily peak of 102 F. declining gradually to normal in the course of five days, although not infrequently daily chill with elevation of temperature to 103-104 F., followed by return to normal, was encountered during the first two to three days (chart 2). These patients were often prostrated and complained of aching eyes and occasionally pain on motion of the eyeballs. A certain number of patients had evidence of inflammation of the upper respiratory tract coincident with the onset of disease. As in the afebrile cases, anorexia, nausea, vomiting and upper abdominal distress developed early in the course of disease. Clinical jaundice appeared twenty-four to forty-eight hours after the temperature reached normal.

TABLE 1.—Preicteric Phase

Total number of patients.....	167	
Average duration in days.....	4.89	
	No. of Patients	Percentage
Malaise.....	138	82
Anorexia.....	133	80
Nausea.....	126	75
Weakness.....	126	75
Aches and pains.....	90	53
Fever.....	90	53
Chills.....	87	52
Upper abdominal distress.....	73	42
Headache.....	59	35
Vomiting.....	55	33
Constipation.....	32	19
Upper respiratory disease.....	29	17
Flatulence.....	24	14
Diarrhea.....	16	9
Frequency.....	7	4
Itching.....	4	2

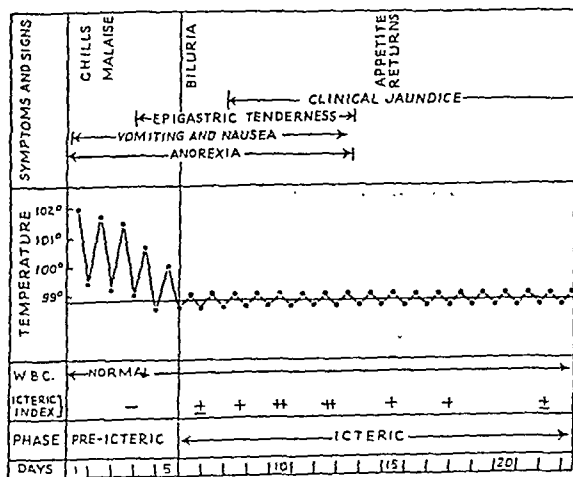


Chart 2.—Course of disease obtained from the averaged assembled data in 200 cases of infectious hepatitis.

interest in flying. Upper abdominal discomfort developed early and was reported as a sense of fulness and aching in the epigastrium and right upper quadrant, particularly evident after eating and occasionally associated with flatulence. Activity or jolting the body usually intensified this discomfort. Occasional patients complained of a sense of tightness and a dragging

Such patients constituted problems in differential diagnosis, and they were usually admitted with the diagnosis of fever of unknown origin. Malaria and, during the early Autumn, sandfly fever were the two diseases most frequently considered. The repeated chills with high fever associated with nausea and vomiting suggested malaria, while the headache, pain in the eyes and discomfort in the eyeballs on motion associated with pyrexia simulated sandfly fever. In such a clinical picture the presence of anorexia was a most important guide to the diagnosis of infectious hepatitis. Later in the preicteric state tenderness over the liver and the appearance of bile in the urine established the diagnosis. The importance of biluria cannot be overemphasized, and daily gross examination of the urine by the medical officer himself for bile did much to establish early diagnosis before clinical jaundice was evident.

An analysis of symptoms in order of their importance appears in table 1.

The icteric phase varied in severity and length from four to eighty-three days, with an average duration of twenty-seven days. Other patients have been observed, however, in whom jaundice lasted one hundred and twenty days (chart 3).

The presence of bile in the urine was the earliest and most frequent sign of developing icterus and usually

preceded the appearance of clinical jaundice by forty-eight to seventy-two hours.

Fever was almost always absent in this phase. Anorexia, nausea, vomiting and epigastric discomfort persisted for two to thirty days in varying degrees of severity, with an average duration of nine to ten days. In the mildest cases these symptoms were slight. However, in the severely sick patients symptoms at times persisted as long as a month. As the jaundice increased the pigment diminished in the stools, and acholic stools commonly occurred in the sicker patients. Constipation was often associated with this and diarrhea occasionally. Such general cholemic symptoms as lassitude, mental irritability and depression were present in a small number of patients. Itching was not common, but at times it was intractable. Occasional patients were seen with severe lacerations of the skin due to scratching. Bradycardia was uncommon and appeared in the first two weeks of jaundice, lasting from five to twelve days but averaging seven days in duration. However, a pulse rate of 60 to 70 was common throughout the period of jaundice when patients were at rest.

Physical examination revealed enlargement of the liver in 58.5 per cent of patients by the time jaundice

Occasional patients⁶ in this series had such mild disease that clinical jaundice was never evident. The presence of the characteristic symptoms with mild tenderness in the right upper quadrant and epigastrium, bile in the urine and elevation of the serum icterus index as high as 12 to 18 units, occurring in patients

TABLE 2.—Icteric Phase

Number of patients.....		200
Average duration in days.....		27.07
Symptoms:	No. of Patients	Percentage
Malaise.....	165	82.5
Anorexia.....	162	81
Nausea.....	145	72.5
Epigastric discomfort.....	89	44.5
Vomiting.....	69	34.5
Itching.....	34	12
Signs:		
.....	117	58.5
.....	108	54
.....	86	43
Enlarged spleen.....	21	10.5
Tender spleen.....	5	2.5
Enlarged spleen and liver.....	13	6.5
Bradycardia.....	26	8.8

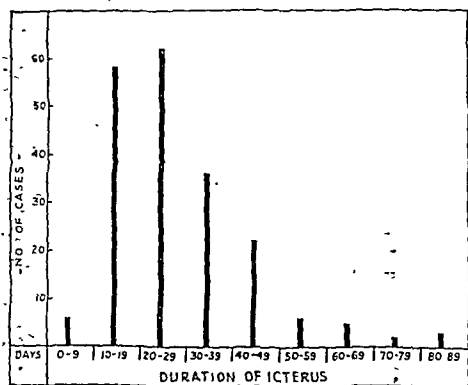


Chart 3.—Duration of icterus (in ten day periods), in 200 patients with infectious hepatitis.

was evident. The edge of the liver was firm and palpable 1 to 2 fingerbreadths below the costal border. While enlargement and tenderness of the liver did not always coincide, both were present in 43 per cent of patients. In general, tenderness subsided in nine to ten days, although it occasionally persisted as long as three weeks. Enlargement of the liver lasted from seven to thirty-three days, with an average duration of twelve days. Epigastric tenderness and distention were often associated, and clinical evidence of pylorospasm with dilatation of the stomach was occasionally present. Vomiting of copious quantities of undigested food and liquids afforded temporary relief. Enlargement and tenderness of the spleen occurred in a small number of patients. These signs and symptoms ordinarily persisted for seven to fifteen days after the appearance of jaundice, diminishing rapidly after the icterus reached its height. Continuation of epigastric discomfort and tender enlarged liver were regarded as signs of persistence of activity of disease.

It has been previously pointed out that mild forms of this disease without clinically evident icterus have occurred among outbreaks of frank jaundice.¹⁴

from groups in which infectious hepatitis was present, suggested the diagnosis of infectious hepatitis without clinical jaundice.

An analysis of signs and symptoms of the icteric phase in order of their importance appears in table 2.

After the icterus reached its height, which generally occurred by the tenth day of jaundice, the symptoms regressed and a sense of well-being returned. Pigment reappeared in the stool in increasing amounts. By this time it was not uncommon for patients to have lost 5 to 10 pounds (2.3 to 4.5 Kg.) and many of them had a ravenous appetite. Strength returned rather quickly in the mild and moderately sick patients. It was observed, however, that activity not uncommonly caused a sense of fullness and discomfort in the abdomen for several days after the patient felt well otherwise. Jaundice faded slowly and patients were kept in the hospital until their icterus index was normal. Most of those who had had mild or moderately severe disease were fit for duty at this time, but those who had been severely sick often required ten days' sick leave. Hospitalization of the entire group ranged from seven to eighty-seven days, with an average length of 29.8 days.

Occasionally the course of disease was more severe in the older patients and recuperation more prolonged. In an effort to correlate the severity and duration of jaundice with the age of the patient it was shown that the greater number, 167 (73.5 per cent), fell in the

TABLE 3.—Relation of Age to Duration of Jaundice

Average Days of Jaundice	
200 patients of entire series.....	27.07
167.....	26
33.....	32.1

decade between 19 and 29. The remaining 33 patients (26.5 per cent) were between 30 and 39 years of age with the exception of 3 (48, 51 and 52 respectively).

Table 3 shows the relation of age to duration of jaundice.

Complications.—The only complication observed in this series was seborrheic dermatitis, which occurred in many patients during the icteric phase. Ascites was not observed in any patient.

14. Cameron, J. D. S.: Infective Hepatitis, *Quart. J. Med.* 12: 139 (July) 1943.

Relapse.—Of 200 patients in this series 3 had a relapse during their course of disease, manifest by an increase in jaundice and exacerbation of symptoms but without fever. The average duration of jaundice in these patients including the relapse was forty-nine days, with an individual variation from forty-three to fifty-eight days. Other patients have been observed who have had fever associated with the onset of a relapse.

It was difficult to associate the occurrence of a relapse with anything in particular. One of the aforementioned patients had received 122 Gm. of sulfaguanidine for bacillary dysentery early in the course of jaundice, given four weeks before the occurrence of the relapse. Another patient not included in this group had a secondary rise in the icterus index after receiving carbarsone in the treatment of amebiasis found incidentally during the course of jaundice.

In individual cases it seemed at times as though overexposure or excessive activity induced an increase in jaundice; however, such occurrences also took place

without preceding overactivity and did not appear to be related to any specific stimulus.

Antisyphilitic Therapy.—It is already recognized that the prevalence of infectious hepatitis is far higher in patients undergoing antisyphilitic therapy.¹⁵ In this group 6 patients had received antisyphilitic therapy in the form of neoarsphenamine, mapharsen or bismuth within three months before onset of jaundice. In these

who had gradually increasing icterus lasting as long as thirty-one days before the peak was reached.

Curves drawn to show the severity and duration of jaundice revealed considerable variation. These variations (based on tests for 180 patients) have been divided into four groups according to the duration of jaundice (chart 4).

GROUP 1.—Sixty-four patients (32 per cent) had jaundice varying from four to nineteen days and constituted examples of mild disease. While the serum icterus index in some of these patients reached as high as 60 units, a few had jaundice of such slight degree that it was not demonstrable clinically.

Case 1 represents a mild case of infectious hepatitis in which jaundice was not evident clinically and its detection was dependent on the icterus index determination and the presence of bile in the urine:

An enlisted white man aged 24 was admitted to the hospital with the chief complaint of nausea, vomiting and diarrhea. The patient was well developed and nourished and was dehydrated. His temperature was 99 F., pulse rate 80 and respiratory rate 20. No icterus was evident. The heart and lungs were normal. There was slight tenderness in the right lower quadrant. The liver and spleen were not felt. On the third day of disease the leukocytes numbered 7,700, with 65 per cent polymorphonuclear cells, 32 per cent lymphocytes, 1 per cent monocytes and 2 per cent basophils. Urinalysis showed albumin 1 plus and bile present in the urine with urobilinogen positive in a dilution of 1:200. The icterus index measured 18 units. The blood Kahn reaction was negative.

His recovery was uneventful and rapid. The nausea and vomiting disappeared after five days. The icterus index was at its maximum, 18 units, on the third day of disease and diminished to normal in the course of the next ten days.

GROUP 2.—Ninety-eight patients (49 per cent) had jaundice lasting twenty to thirty-nine days and made up the group having moderately severe disease. The serum icterus index very often ranged as high as 80 to 90 units.

CASE 2.—A medical officer aged 22 was admitted on Jan. 26, 1943 with the chief complaint of dark urine of four days' duration. Eight days before admission he had a sudden onset with chills, fever and anorexia, generalized aches and pains, with headache and pain in the eyes on motion. Clinical jaundice became evident two days before admission.

The patient was well developed and nourished. He was jaundiced but did not appear sick. His temperature was 98.6 F., pulse rate 88 and respiratory rate 18. Examination was essentially negative except that the liver was tender and palpable 1 fingerbreadth below the costal border. The erythrocytes numbered 4,240,000, hemoglobin was 85 per cent and leukocytes numbered 4,650, with 65 per cent polymorphonuclear cells, 20 per cent lymphocytes, 8 per cent monocytes and 1 per cent basophils. The serum icterus index measured 54 units. The blood Kahn reaction was negative. Urinalysis revealed bile and albumin 3 plus. The icterus index reached its height of 72 units on the tenth day of the disease and receded over the next eleven days to normal. Anorexia and tenderness of the liver subsided shortly after the jaundice reached its height, and recovery was uneventful.

GROUP 3.—Thirty-eight patients (19 per cent) had jaundice lasting from forty to eighty-three days, constituting the group with severe disease. The icterus index was as high as 149 units in an occasional patient.

Case 3 represented a severe case of infectious hepatitis, prolonged over a period of eighty-three days:

CASE 3.—An enlisted man aged 22 was admitted to the hospital Aug. 15, 1943 with the chief complaint of dark urine for three days. Three days before admission he had been feverish and had generalized aches and pains, profuse sweats, anorexia

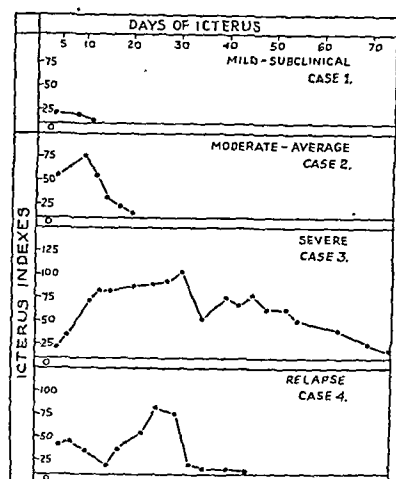


Chart 4.—Levels and trends of jaundice as measured by serum icterus index determination in a mild, moderate and severe case of infectious hepatitis and in a case with relapse.

patients the average period of jaundice was prolonged over the usual to 39.8 days, with individual variations ranging from twelve to eighty days.

Recurrence.—No patients were encountered who had acquired this disease twice in the Middle East.

Postvaccinal Hepatitis.—Two patients of this series had had postvaccinal hepatitis following the administration of yellow fever vaccine one year before the onset of infectious hepatitis. Their course of disease was similar to that of the average case.

Course of Icterus.—Frequent serial determinations of the serum icterus index throughout the course of disease has demonstrated that the maximum peak of jaundice was reached within the first ten days after appearance in 80 per cent of patients. The remaining patients reached their high point during the ensuing four to five days, with the exception of a few patients

15. Marshall, J.: Jaundice in Syphilitics (Coincidence of Increase of Infective Hepatitis), *Brit. J. Ven. Dis.* 19:52-58 (June) 1943. Ruge, R.: Die akute Leberatrophie und ihre Beziehung zu Syphilis und Salvarsan nach den in der Marine von 1920-1925 beobachteten Fällen, *Arch. f. Dermat. u. Syph.* 153:518, 1927; Die Zusammenhänge zwischen Syphilis, Salvarsan, und der sog. katarrhalischen Gelbsucht auf Grund von 2500 in der Marine von 1919-1929 beobachteten Fällen, *Dermat. u. Wehnschr.* 94:278 (Feb. 20) 1932. Anderson, T. F.: Jaundice in Syphilitics, *Brit. J. Ven. Dis.* 19:58-67 (June) 1943. Mitchell, H. S.: Incidence Compared with Jaundice Following Arsenotherapy for Syphilis, *Canad. M. A. J.* 48:94-96 (Feb.) 1943.

and constipation. He continued to feel bad and the day before admission had generalized abdominal pain, with nausea and vomiting.

The patient was well developed but dehydrated. He was not in acute distress. His temperature was 98.6 F., pulse rate 80 and respiratory rate 20. There was a faint icteric tint to the scleras. The heart and lungs were normal. There was generalized abdominal tenderness, and the liver was palpable 1 finger-breadth below the costal border. The leukocytes numbered 8,200, with 77 per cent polymorphonuclear leukocytes, 18 per cent lymphocytes and 5 per cent monocytes. Urinalysis showed albumin 2 plus. The serum icterus index measured 22 units. The blood Kahn reaction was negative. During the ensuing thirty days the icterus index ascended gradually to its maximum 102. During much of this time the patient was prostrated with anorexia, nausea and intermittent vomiting. Mental irritability was present and he lost approximately 12 pounds (5.4 Kg.).

Following the peak of jaundice came a slow decline of icterus over the subsequent fifty-three days. Return of appetite came slowly after the jaundice began to decline. Recovery was apparently complete and the patient was discharged after eighty-three days of hospitalization.

GROUP 4.—Relapse was a rare occurrence, being present in only 3 of 200 patients.

Case 4 represented a moderately severe case of infectious hepatitis with relapse:

CASE 4.—An enlisted man aged 24 was admitted to the hospital Nov. 7, 1943 with the chief complaints of nausea, anorexia and flatulence for eight days. His urine had been dark for five days.

The patient was well developed and nourished. His temperature was 97.4 F., pulse rate 80 and respiratory rate 20. The scleras were mildly icteric. The heart and lungs were normal, and the liver and spleen were not palpable. The leukocytes numbered 6,200, with 68 per cent polymorphonuclear cells, 28 per cent lymphocytes and 4 per cent monocytes. Urinalysis revealed bile. The serum icterus index measured 41 units, and 75 per cent bromsulphalein dye was retained in the blood after thirty minutes. The blood Kahn reaction was negative.

The icterus index reached its high point of 44 units on the eighth day of jaundice and then diminished over the ensuing week to 19 units. The patient's symptoms of anorexia and nausea had ameliorated. On the seventeenth day of jaundice, however, he began to feel worse with anorexia, nausea and discomfort in the epigastrium and right upper quadrant. The jaundice began to increase again and reached a maximum of 85 units on the twenty-sixth day of jaundice, from which point it descended over the ensuing three weeks to normal. His symptoms improved rapidly as the jaundice declined.

Nothing definite could be found which might have precipitated this relapse.

LABORATORY STUDIES

1. **Blood Counts.**—Complete blood counts were done on 183 patients at varying stages of the disease. The erythrocytes averaged 4,500,000 and the hemoglobin 85 per cent (Sahli). Total leukocyte counts were within normal limits, with rare deviations from 4,500 to 10,200 and averaging 6,200. Relatively few leukocyte counts were performed in the preicteric phase, but those done were essentially normal. A slight increase in monocytes was observed in several patients during the first ten days of the icteric phase, with individual counts as high as 14 per cent, although the average in the icteric phase was 5.2 per cent. In general there was nothing distinctive or diagnostic.

2. **Coagulation and Bleeding Time.**—The coagulation and bleeding time of the blood and erythrocyte fragility were measured in 38 and 42 patients respectively and were found to be normal.

3. **Icterus Index.**—The serum icterus index of 180 patients was measured. The reading of 10 units was

selected as the upper limit of normal, and any measurements over this were considered to be indications of icterus. Determinations at various times throughout the course of disease in 180 patients varied from 10 to 149 units. In occasional patients the serum icterus index was only slightly elevated above normal from 12 to 18 units when clinical icterus was at times impossible to detect. In many patients in whom the jaundice disappeared slowly at the end of the disease the icterus index was useful in determining whether subclinical jaundice was still present. Although the serum icterus index is less delicate than the serum bilirubin determination as a test of the excretory function of the liver, it proved a practical test under conditions in which more elaborate laboratory facilities were not available at all times.

Serum Bilirubin.—Qualitative and quantitative van den Bergh determinations were made on the serum of 60 patients, in various stages of jaundice. The qualitative van den Bergh was positive direct in all but 3 patients; many of these determinations were made within the first five days of jaundice. Two negative direct and one biphasic reaction were encountered in

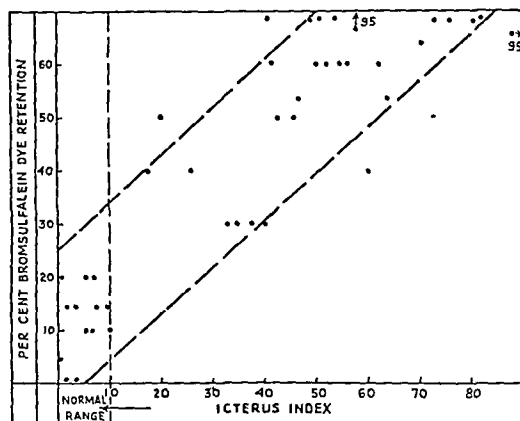


Chart 5.—Correlation between height of serum icterus index and percentage of bromsulphalein dye retained in the blood thirty minutes after intravenous injection of 15.15 mg. per 55 pounds (25 Kg.) of body weight. The two determinations were made in blood drawn the same day.

patients with a serum bilirubin measuring around 1.5 mg., occurring either at the beginning or at the termination of jaundice.

The serum bilirubin determinations in this group of 60 patients ranged as high as 10.8 mg. Although a more delicate test of liver function than the icterus index determination, the inability to have available constantly the materials necessary for the performance of the test limited its usefulness under the conditions of military hospitalization.

4. **Liver Function Tests.**—As a further test of the excretory function of the liver the bromsulphalein dye retention test was used. In patients with infectious hepatitis it was found that the more pronounced jaundice the greater the amount of dye was retained in the blood, indicating the degree of severity of impairment of the function of the liver.

An effort was made to correlate the amount of bromsulphalein dye retained in the blood after thirty minutes with the height of the icterus index. Simultaneous determinations were made on 48 patients on various days ranging from the second to the thirty-second day. Patients whose icterus index was 20 or below showed little evidence of impairment of bromsulphalein dye

excretion, most of the figures ranging between 5 per cent and 15 per cent of dye retained in the blood (chart 5). As the icterus index rose, however, the retention of dye in the blood increased proportionately, so that in general the higher the icterus index the greater the amount of dye retained in the blood, up to 75 per cent dye retention. Although several patients had an icterus index ranging from 60 to 96 units, only 1 showed more than 75 per cent retention of bromsulphalein in the blood.

5. Blood Kahn Reaction.—Kahn tests were performed on 180 patients in various stages of the disease in both preicteric and icteric phases. One patient had a 2 plus reaction on the sixteenth and twenty-fifth days of disease. No history of venereal exposure was elicited and it was thought that the positive reaction was related to the acute infection. Subsequent tests were advised, but we were unable to follow the patient.

6. Urinalysis.—Of 184 patients on whom urinalysis was performed 72 (39 per cent) had albumin early in the course of disease, frequently in the preicteric phase. Increased urobilinogen in the urine was found to be a good diagnostic measure before clinical jaundice was evident. Biliuria was most often the first evidence of jaundice presented by the patient, and it persisted throughout the greater part of the icteric phase. Otherwise the urine was normal.

7. Stools.—In a large number of cases the stool became light in color early in the icteric phase, and in the more severely sick patients acholic stools were common, although exact percentages were not obtained. This was frequently associated with constipation and flatulence.

Cultures were made of the stools of 58 patients, and of those 12 per cent were found to contain dysentery bacilli of the Flexner or Hiss group. This percentage of carriers was not unusual for troops in the area at this time. Diarrhea was usually not associated with the positive stools and, since most of the patients had had previous history of diarrhea, it was assumed that they were carriers. They were treated with sulfaguanidine in therapeutic doses.

THERAPY

The treatment of this disease was symptomatic. It was entirely possible for those patients with subclinical jaundice or very mild disease to remain ambulatory, but for the sicker patients hospitalization with bed rest was indicated during the acute phase, since activity apparently aggravated the symptoms of even the mildly sick when they were obliged to live under field conditions. As recovery took place and jaundice waned, increasing activity according to the tolerance of the individual patient was advised. Chilling and excessive activity were avoided.

Full, unrestricted diet was given as soon as the patient could tolerate it. Supplementary vitamins were added, although their utilization and value were undetermined. Early in the course of disease when anorexia, nausea and upper abdominal discomfort were present, difficulty was encountered in providing adequate food intake. Diet rich in proteins and carbohydrate was given. No advantage was demonstrated for excessive intake of carbohydrates except that it provided for some patients a more palatable way of increasing their amount of food eaten. Fats were not withheld unless the patient was unable to tolerate them. This occurred at times when bile was completely absent from the

gastrointestinal tract. Frequent small feedings were better tolerated than large meals at longer intervals.

Duodenal drainage was performed on 90 of the 200 patients as a "therapeutic" measure. The average duration of jaundice in all patients was twenty-seven days. In the 110 patients who did not have biliary drainage the average period of jaundice was 23.8 days, while in the 90 patients who had biliary drainage performed the average period of jaundice was thirty-one days. No reason could be found to account for this discrepancy. There was no selection of cases according to severity. Sixty per cent of the drainages were done within the first ten days of jaundice when most of the patients were reaching their maximum icterus. It is of interest to note that in most cases in which drainage was performed during the height of jaundice no B (dark) bile was obtained. It is impossible to draw any inference from these data to indicate that biliary drainage had any beneficial effect. No opinion can be given as to whether it had any effect on prolonging the jaundice.

Constipation was relieved by the administration of $\frac{1}{2}$ to 1 ounce (15 to 30 Gm.) of crystalline sodium sulfate in warm water each morning before breakfast. Many patients stated that this afforded relief of the sense of fullness and epigastric oppression.

Anorexia, nausea and vomiting were ameliorated at times by giving 0.0325 Gm. of phenobarbital three times daily, but intractable vomiting at times required the administration of parenteral fluids in the form of 2,000 to 3,000 cc. of 5 per cent dextrose in isotonic solution of sodium chloride intravenously.

Upper abdominal distress was severe enough at times to require codeine sulfate 0.065 Gm., but frequently the application of local heat was of benefit.

Itching was relieved by the administration of 0.0325 Gm. of phenobarbital three times daily, and for more severe cases the local application of calamine lotion containing 1 per cent phenol afforded relief.

Sulfonamides.—Seven patients in this group of 200 patients received sulfonamides in full therapeutic dosages. Six of them had sulfaguanidine for dysentery and 1 sulfathiazole for chancroid. To all patients the drug was given early in the course of jaundice. One patient had a relapse of jaundice about four weeks after the cessation of sulfaguanidine. However, the course of jaundice in this group of seven averaged twenty-three days, with individual variations ranging from twelve to forty-six days, so that no evidence was available from this small number that sulfonamides were detrimental.

SUMMARY

Infectious hepatitis has assumed epidemic proportions in British, Italian, German, French and American troops during the past two to three years in the Middle East, with a sharp seasonal prevalence beginning in late October and reaching a peak in late January.

The clinical picture of the disease among 200 American troops admitted to an American General Hospital in the Middle East was found to be similar to that described by British observers.

An acute onset initiated a clearly defined preicteric period of five days characterized by anorexia, chilliness, fever, headache, nausea, vomiting, upper abdominal discomfort and generalized aches and pains.

This phase was terminated by the decline of fever and the appearance of dark urine, which marked the onset of the icteric phase. Anorexia, nausea, vomiting and epigastric distress were associated with hepatic

enlargement and tenderness during the first ten days of jaundice; at the end of this period the icterus usually diminished and the signs and symptoms regressed. Recovery was uneventful in practically every case. Only 3 patients had relapse, and no associated etiologic factor could be determined in these cases. The average duration of jaundice was twenty-seven days, and patients over 30 years of age averaged five days more in duration of icterus. Patients who received anti-syphilitic therapy within three months before the onset of disease had their jaundice prolonged twelve days more than the average. A few patients received sulfonamide, and no effect could be observed on the jaundice.

Individual patients manifested all degrees of severity of disease, ranging from the mild case with subclinical jaundice in which icterus was detected only by examination of the urine and blood serum to the severely prostrated patient with deep jaundice prolonged over a period of eighty-three days. Eighty-one per cent of patients had mild to moderately severe disease, while 19 per cent had severe jaundice.

Laboratory studies revealed that blood counts, coagulation and bleeding time and erythrocyte fragility tests were normal. The serum icterus index was used as a measurement of icterus and was found to be valuable both alone and in conjunction with the bromsulphalein dye retention test. It was found that the percentage of dye retained in the blood was in direct proportion to the height of the icterus index. The blood Kahn tests were negative in all but 1 patient.

Urinalysis gave the most important early clue to diagnosis, and the occurrence of biliuria cannot be stressed enough as an important diagnostic measure. Albuminuria was present in a goodly percentage of patients.

Duodenal drainage was performed on a large number of patients early in the course of jaundice and failed to shorten the disease.

Pigment disappeared from the stools of a large number of the patients as the icterus approached its height and, in the severely sick, acholic stools were common.

CONCLUSIONS

1. Data from 200 cases of infectious hepatitis in American troops occurring between Nov. 11, 1942 and Feb. 1, 1944 in the Middle East were assembled and analyzed.

2. The course of disease in these troops simulated the clinical descriptions of British observers.

3. Because of prolonged hospitalization (average 28.8 days) infectious hepatitis constitutes a problem of military importance.

4. The most important simple laboratory procedure in diagnosis was examination of the urine for bile at the bedside of the patient by the medical officer.

5. The serum icterus index determination afforded a simple, effective method of following the course of jaundice and demonstrating subclinical icterus under the circumstances of military hospitalization.

Fuel Requirement of Man.—The energy requirement of a person for twenty-four hours or for a shorter period, expressed in calories, can be determined with a high degree of accuracy. This figure is the sum of (a) the basal metabolism, (b) the energy liberated in exercise or work and (c) the increment of energy due to the specific dynamic action of food, the so-called cost of digestion.—McLester, James S.: *Nutrition and Diet in Health and Disease*, Philadelphia, W. B. Saunders Company, 1943.

EFFECT OF INTRAVENOUS FLUIDS ON DEHYDRATED PATIENTS AND ON NORMAL SUBJECTS

CARDIAC OUTPUT, STROKE VOLUME, PULSE RATE AND BLOOD PRESSURE

JAMES D. HARDY, M.D.

AND

LINCOLN GODFREY JR., M.D.

PHILADELPHIA

Dehydration is frequently encountered in both medical and surgical patients. Whether dehydration is the result of vomiting, diarrhea, inability to swallow or electrolyte derangement such as occurs in diabetic acidosis,¹ the intravenous administration of fluids is the mode of therapy usually relied on to restore the normal state of hydration and electrolyte balance. Indeed, so routinely and with such gratifying results are intravenous fluids used for these patients that the physician seldom pauses to consider the exact effect of his therapy

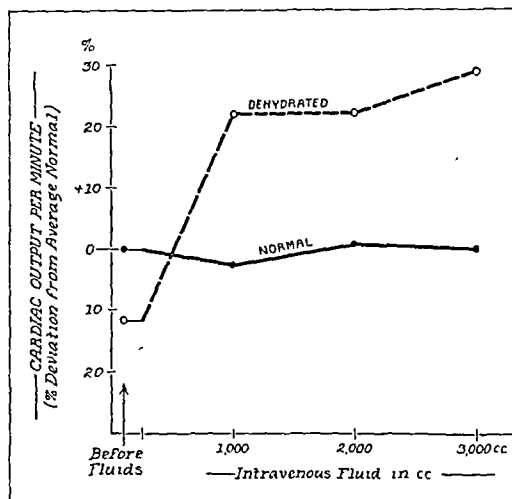


Fig. 1.—The cardiac output of the normal subjects has been averaged and is compared graphically with the average of the dehydrated patients, before and after intravenous fluid administration.

on the cardiovascular system. Previous reports in the literature have dealt with the effect of intravenous infusions on pulse rate, blood pressure, blood volume, venous pressure, velocity of blood flow and the electrocardiogram.² Altschule and Gilligan³ have also reported the changes in cardiac output in normal men. However, no workers, so far as we are aware, have studied the effect of intravenous fluids on cardiac output in dehydrated patients as compared with the effect on normal subjects. For this reason, two such groups have been investigated and the results are reported here. Except in 1 instance, in which no blood chemistry determinations were done, no patient was considered

From the Medical Clinic and the Research Department of Therapeutics, Hospital of the University of Pennsylvania.

This study was made at the suggestion of Dr. Isaac Starr, who permitted us to use his laboratory and showed us numerous other kindnesses.

1. McCance, R. A.: *Medical Problems in Mineral Metabolism: II. Sodium Deficiencies in Clinical Medicine*, *Lancet* 1: 704, 1936.

2. Bainbridge, F. A.: *The Influence of Venous Filling on the Rate of the Heart*, *J. Physiol.* 50: 65, 1915. Kahn, M. H.: *The Influence of Venous Filling on the Heart*, *Ann. Int. Med.* 3: 969, 1930. Gilligan, D. R.; Altschule, M. D., and Volk, M. C.: *The Effects on the Cardiovascular System of Fluids Administered Intravenously in Man: II. Studies of the Amount and Duration of Changes in Blood Volume*, *J. Clin. Investigation* 17: 7, 1938. Altschule and Gilligan.

3. Altschule, M. D., and Gilligan, D. R.: *The Effects on the Cardiovascular System of Fluids Administered Intravenously in Man: II. The Dynamics of the Circulation*, *J. Clin. Investigation* 17: 401, 1938.

dehydrated who did not present abnormal blood chemistry values as outlined in the table. The dehydrated individuals experienced a pronounced increase in cardiac output after the infusions, while the normal subjects presented little or no such rise.

CLINICAL MATERIAL

The patients were examined as soon as possible after reaching the hospital, and when dehydration was found to exist the subject was taken on a litter directly to the ballistocardiograph, having no treatment prior to the test. Blood was drawn for determinations of serum protein, serum chloride and blood urea nitrogen. The diagnoses of the dehydrated subjects are listed in the table. The control group consisted of the authors, of subject J. M., tested first just after admission when he was dehydrated, who volunteered to repeat the test

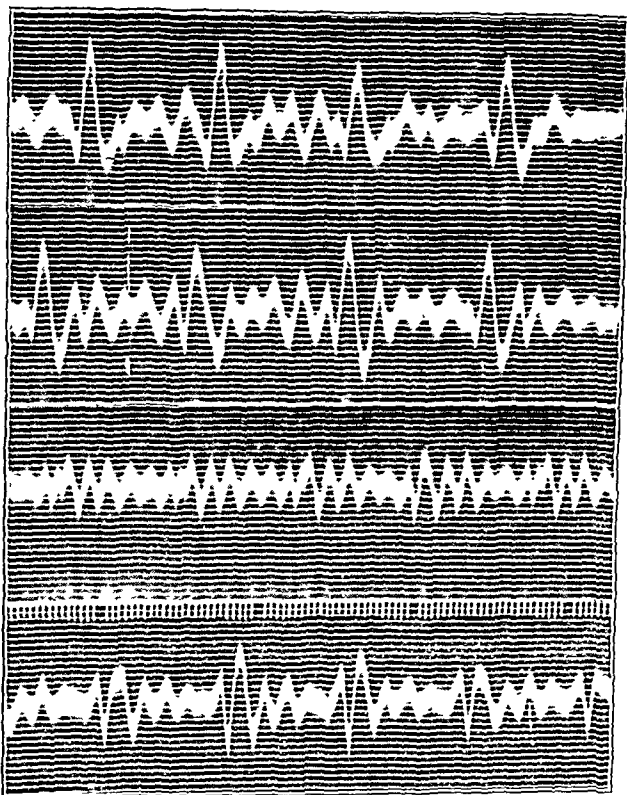


Fig. 2.—Typical ballistocardiographic tracings of a normal subject before and after intravenous fluid administration are compared with those of a dehydrated patient. Top subject, L. G. before fluids. Second, L. G. after 3,000 cc. of intravenous fluid. Third patient, J. M. before fluids. Fourth patient, J. M. after 3,000 cc. of intravenous fluid. The time record applies to all tracings. Largest interval equals one second.

fifteen days later when all evidence of dehydration had disappeared, and of 3 patients normal from the point of view of this study but to whom it was necessary to give fluid intravenously. The blood chemistry values for this group are recorded in the table; all were within the normal range.

TECHNIC

The intravenous fluids were given with the subject lying on the ballistocardiograph table,⁴ so that measurements of cardiac output could be made at will. The ballistocardiograph consists essentially of a table suspended by wires and free to move in a lengthwise direction only, of an optical system attached to the

table which magnifies its movements by the deflections of a beam of light, and of a camera which photographs the movements of the beam of light. When the patient lies lengthwise on the table, the recoil of his body downward when ejection of blood from the heart commences, followed by a movement upward when the blood is turned by the aortic arch, is transmitted to the ballistocardiograph table and a corresponding deflection of the beam of light is produced. In persons of the same age, height and weight the greater the excursions of the beam of light, the greater is the stroke volume. Cardiac output was calculated by the area method and the correction of Cournand, Ranges and Riley⁵ was employed. By means of a timer, the heart rate can be calculated from the film.

After the subject had lain quietly on the table for fifteen minutes, readings of cardiac output, stroke volume, pulse rate and blood pressure were taken. Following this, intravenous fluids were begun at a rate of around 20 cc. per minute, approximately two hours being required for the administration of 2,500 cc. Though there was an occasional exception, the first liter of fluid was usually isotonic solution of sodium chloride, the second 5 per cent dextrose in isotonic solution of sodium chloride and the third (when used) 5 per cent dextrose in water. Ballistocardiograms, pulse rate and blood pressure readings were taken after each liter of fluid. Owing to the illness of the dehydrated patients, the observations were terminated as soon as all the necessary fluid was in.

RESULTS

From the data recorded in the table, it will be seen that the cardiac output of the dehydrated group, expressed as percentage deviation above or below the average normal cardiac output per pound per minute,⁶ increased substantially with the administration of intravenous fluids, while that of the normal group underwent no such rise. These results are represented graphically in figure 1. The increases in cardiac output were caused chiefly by increases in stroke volume. In figure 2 are typical ballistocardiograph tracings of a normal subject and of a dehydrated patient, taken before and after the intravenous administration of fluids.

Of particular interest were the responses of 1 patient (J. M.). He was admitted to the hospital acutely dehydrated with symptoms suggestive of pyloric obstruction due to a peptic ulcer. After the administration of 3,000 cc. of fluid intravenously, his cardiac output rose 41 per cent. He responded well to conservative therapy and was eating a normal diet within one week. Fifteen days after admission he was again given 3,000 cc. of fluid, and this time his cardiac output fell 1 per cent.

It is worth noting that 3,000 cc. of fluid administered intravenously provoked no subjective symptoms in any of the normal subjects, but it was followed by a prompt diuresis.

COMMENT

It was evident that the normal persons had to void frequently during the infusion and that the dehydrated patients did not. Thus in the latter group more fluid was retained in the body. Previous workers⁷ have

4. Starr, I.; Rawson, A. J.; Schroeder, H. A., and Joseph, N. R.: Studies on the Estimation of Cardiac Output in Man, and Abnormalities in Cardiac Function from the Heart's Recoil and the Blood's Impacts: The Ballistocardiogram, *Am. J. Physiol.* 127: 1, 1939.

5. Cournand, A.; Ranges, H. A., and Riley, R. L.: Comparison of Results of the Normal Ballistocardiogram and Direct Fick Method in Measuring Cardiac Output in Man, *J. Clin. Investigation* 21: 287, 1942.
6. Starr, I., and Schroeder, H. A.: Ballistocardiogram: II. Normal Standards, *J. Clin. Investigation* 19: 437, 1940.
7. Meek, C. L.: The Effect of Plethora and Variations in Venous Pressure on Diastolic Size and Output of the Heart, *Am. J. Physiol.* 61: 186, 1922. Robertson, J. D.: Blood Volume Changes After Intravenous Infusions, *Lancet* 2: 634, 1938. Altschule and Gilligan.² Gilligan, Altschule and Volk.²

shown that fluids given intravenously usually increase the circulating blood volume, and this doubtless occurred in most of our dehydrated patients. But in 1 dehydrated subject no dilution of blood proteins was demonstrated after the infusion. Though it is possible that a change in serum protein within the limits of laboratory error occurred, the increased cardiac output in such a case might be attributed partly to an improved condition of the myocardium, and of the vasomotor center of the brain when needed sodium chloride and water were supplied. That intravenous dextrose can

the feeling of general well-being so often experienced by the dehydrated patient after receiving fluid intravenously is accompanied by concomitant objective changes in the circulatory dynamics. That the maximum effect is quite often produced by the first liter of fluid suggests that this amount may be sufficient in instances in which there is danger of giving too much fluid intravenously. To state this somewhat differently, when giving fluids intravenously to dehydrated patients one should remain aware of the increased work which such therapy imposes on the hearts of these persons.

Effect of Intravenous Fluid Administration on Cardiac Output, Stroke Volume, Pulse Rate and Blood Pressure

Name, Sex, Age, Height, Weight	Intravenous Fluid, Cc.	Pulse Rate, per Min.	Blood Pressure, Mm. Hg	Cardiac Output per Minute, per Cent Deviation from Average Normal	Stroke Volume per Beat, Cc.	Blood Urea Nitrogen, Mg. per 100 Cc.	Serum Protein, Gm. per 100 Cc.	Serum Chloride, MEq per Liter	Diagnosis and Comment
Persons Showing No Evidence of Dehydration									
J. M., ♂ 47 years 5 ft. 7 in. 180 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	70 66 72 64	104/70 100/60 96/58 104/70	-12% -6% -2% -13%	40 44 44 47	11	7.6	103.4	Pyloric stenosis; asymptomatic for 1 week prior to test
L. G., ♂ 27 years 5 ft. 11 in. 188 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	66 70 68 66	136/76 118/72 114/70 114/70	-17% -17% -17% -22%	65 61 64 60	10	6.6	.....	Healthy physician
J. D. H., ♂ 25 years 5 ft. 11 in. 165 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	68 64 67 70	120/80 115/55 115/55 100/50	+3% -1% +7% +5%	67 63 74 67	12	7.1	102.6	Healthy physician
E. N., ♀ 32 years 5 ft. 4 in. 94 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	84 78 73 78	114/86 96/70 80/56 90/64	0 -10% -2% +15%	33 30 36 38	8	6.9	102.7	Syphilitic; gastric crises; nausea and vomiting; not clinically dehydrated
L. L., ♀ 58 years 5 ft. 2 in. 116 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	102 91 89	104/70 104/64 110/68	+27% +18% +20%	40 41 43	13 11	6.7 6.8	96.0 100.8	Mild pneumonitis
C. W. O., ♂ 61 years 5 ft. 9 in. 134 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	78 70 65 60	98/70 105/70 108/68 106/70	-1% 0 +1% +13%	46 52 57 68	9	5.3	97.6	Pyloric stenosis; mild vomiting; not clinically dehydrated
Patients Who Were Dehydrated									
J. M., ♂ 47 years 5 ft. 7 in. 105 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	77 65 73 78	90/80 110/70 110/65 110/65	-13% -2% +23% +28%	36 49 55 54	35 27	8.9 6.3	91.7 98.5	Pyloric stenosis; vomiting for 3 days
M. M., ♀ 29 years 5 ft. 2 in. 88 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	77 78 91 92	108/76 110/75 108/68 100/60	-10% +35% +20% +30%	27 53 32 26	..	...	.....	Psychic vomiting; considerably dehydrated on clinical examination
J. L., ♂ 47 years 5 ft. 10 in. 205 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	75 80 84	130/80 130/70 146/74	-20% -7% -1%	59 65 65	27 19	6.3 6.3	98.5 92.3	Intestinal obstruction; nausea and vomiting
J. R., ♂ 63 years 5 ft. 7 in. 105 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	84 77	130/110 130/80	-22% +9%	27 40	60	6.9	70.7	High intestinal obstruction
H. W., ♀ 76 years 5 ft. 5 in. 80 pounds	1. Before fluid 2. 1,000 3. 2,000 4. 3,000	84 79 80	110/70 130/60 136/60	+7% +61% +60%	27 43 43	69 16	6.9 4.4	74.7 99.7	High intestinal obstruction

stimulate a diseased heart was demonstrated by Edmunds and Cooper,⁸ but in our experiments the maximum increase occurred after the first liter of fluid before any dextrose had been given; so we are not inclined to weigh this factor heavily. Despite the uncertainty regarding the exact mechanism, it is obvious that intravenous fluids may cause effects in diseased subjects very different from those observed in healthy persons.

In conclusion, several clinical considerations merit emphasis. It is evident from the results recorded that

SUMMARY

1. The effect of intravenous fluids on the cardiac output, stroke volume, pulse rate and blood pressure of a group of dehydrated patients was compared with similar observations made in a group of subjects not demonstrably dehydrated.

2. The dehydrated group manifested a prompt and significant rise in cardiac output, resulting chiefly from an increase in stroke volume, and this was accompanied by a small increase in the pulse pressure.

3. Similar effects were not observed in the control group, although a smaller and more delayed increase in cardiac output was found in 2 subjects who had been vomiting.

8. Edmunds, C. W., and Cooper, R. G.: Action of Cardiac Stimulants in Circulatory Failure Due to Diphtheria. J. A. M. A. 85: 1798 (Dec. 5) 1925.

Clinical Notes, Suggestions and New Instruments

COMPRESSION OF SEVENTH CERVICAL NERVE ROOT BY HERNIATION OF AN INTERVERTEBRAL DISK

PAUL C. BUCY, M.D., AND HARVEY CHENAULT, M.D.
CHICAGO

Several cases of herniation of a cervical intervertebral disk have been recorded in the literature, but nearly all of these have been instances in which compression of the spinal cord itself by a midline herniation predominated.¹ Semmes and Murphy² mention 4 cases from the literature which presented symptoms of compression of a cervical nerve root without involvement of the spinal cord and present 4 similar cases of their own. Three of the latter cases of unilateral herniation of a cervical intervertebral disk were verified by operation. The syndrome of compression of the seventh cervical nerve root as shown in the latter 4 cases was remarkably constant and occurred on the left side in all 4. All these patients gave a history of numerous "cricks" in the neck for months or years preceding the severe attack. Two gave a definite history of trauma to, or motion of, the neck as precipitating factors. In all the predominant symptom was excruciating pain. The radiation of the pain was to three regions: "(1) the precordium, (2) a point just medial to the upper angle of the scapula and (3) down the lateral and medial surfaces of the arm." In the 3 cases which presented objective sensory loss the disturbance consisted of hypalgesia and hypesthesia "limited to the index and middle fingers without involvement of the thumb, the hand or the forearm."

Recently there has come under our observation such a case of unilateral herniation of a cervical intervertebral disk in which there were certain differences from the syndrome as presented by Semmes and Murphy.

REPORT OF CASE

C. H., a white man aged 41, a factory fireman, referred by Dr. Luther J. Osgood of Waukegan, Ill., was admitted to the Illinois Neuropsychiatric Institute on Dec. 1, 1943 with a complaint of "pins and needles," "creeping" or "electricity" in the thumb, index and middle fingers of the right hand, which extended up the radial aspect of the right forearm. The past medical, family and marital histories were irrelevant.

The patient stated that he was quite well until January 1938, when he slipped and fell in an icy alley, striking the back of his head and shoulders on the pavement. He was not knocked unconscious and continued on his way to work with only a

mild headache, which lasted not longer than two hours. He thereafter felt well and had no pain in the neck or shoulders from the fall. He did not even develop any swelling of his scalp. However, two days later he began to have a dull, continuous, aching pain in the region of the right shoulder blade (he indicated a localized area just beneath the medial portion of the spine of the scapula). The pain became increasingly severe in the next week. As a result he had to leave his work as a fireman.

The pain remained localized, nonradiating and severe. There was no associated numbness or paresthesias comparable to the present complaint at that time. He had chiropractic treatments, which made the pain so much more severe that he was obliged to stop them. Conservative treatment with heat and medicines prescribed by numerous physicians was to no avail. The pain in the region of the scapula gradually disappeared after six or seven weeks. Thereafter he was quite well in all respects and able to continue his work until six months later (summer of 1938), when he had another bout of the same pain, lasting three weeks. This time the scapular pain was associated with a sensation of "pins and needles" in the right thumb and the index and middle fingers, which extended up the radial aspect of the forearm nearly to the elbow. Osteopathic treatments were given, and again both the pain and the paresthesias gradually receded. Thereafter he was entirely



Area of hypesthesia resulting from compression of the right seventh cervical spinal root by a herniation of the intervertebral disk.

well for one and a half to two years, when in 1940, without a known precipitating cause, he had a very severe recurrence of the same pain in the same location which lasted altogether about six months. The pain was again associated with the same paresthesias and was excruciating. It was so aggravated by lying down that for two months he had to sleep sitting upright in an easy chair. He went to numerous physicians, one of whom operated on the right side of his neck (apparently an anterior scalenotomy) without relief. The pain and paresthesia gradually receded over the next three months, during which time he received physical therapy to the right upper extremity for approximately two months.

He was again entirely well until about June 1943 (six months prior to admission), when he noticed recurrence of the paresthesias without pain the day after helping a friend move his household belongings. The abnormal sensations were continuous up to his admission here, but at no time after 1940 did he experience a recurrence of the pain from which he suffered earlier. If he held himself perfectly still, he experienced none of the paresthesias. He usually slept with his right hand underneath his head. Raising either arm above his head, throwing his head back in hyperextension of the neck, or moving the neck about in nearly any way evoked the crawling sensation in the right thumb and the index and middle fingers, extending up the radial border of the right forearm. Specific questioning revealed no history of "cricks" in the neck before or during the present illness. Though he had no pain, the paresthesias

From the Department of Neurology and Neurological Surgery and the Illinois Neuropsychiatric Institute, University of Illinois College of Medicine.

1. Adson, A. W., and Ott, W. O.: Results of the Removal of Tumors of the Spinal Cord, Arch. Neurol. & Psychiat. 8: 520-537 (Nov.) 1922.
Adson, A. W.: Diagnosis and Treatment of Tumors of the Spinal Cord, Northwest Med. 24: 309-317 (July) 1925.
Bradford, F. K., and Spurling, R. G.: The Intervertebral Disk, Springfield, Ill., Charles C Thomas, Publisher, 1941.
Elsberg, C. A.: Tumors of the Spinal Cord, New York, Paul B. Hoeber, 1925.
The Extradural Ventral Chondromas (Echondroses): Their Favorite Sites, the Spinal Cord and Root Symptoms They Produce and Their Surgical Treatment, Bull. Neurol. Inst. New York 1: 350-388 (June) 1931.
Hawke, W. A.: Spinal Compression Caused by Echondrosis of the Intervertebral Fibrocartilage with a Review of the Recent Literature, Brain 59: 204-224 (June) 1936.
Love, J. G.: Protrusion of the Intervertebral Disk (Fibrocartilage) into the Spinal Canal, Proc. Staff Meet., Mayo Clin. 11: 529-535 (Aug. 19) 1936.
Love, J. G., and Camp, J. D.: Root Pain Resulting from Intraspinal Protrusion of Intervertebral Disks: Diagnosis and Surgical Treatment, J. Bone & Joint Surg. 19: 776-804 (July) 1937.
Love, J. G., and Walsh, M. N.: Intraspinal Protrusion of Intervertebral Disks, Arch. Surg. 40: 454-484 (March) 1940.
Protruded Intervertebral Disks: A Surg. Report of 180 Cases in Which Operation Was Performed, J. A. M. A. 111: 396-400 (July 30) 1938.
Mittler, W. J., and Ayer, J. B.: Herniation or Rupture of the Intervertebral Disk into the Spinal Canal, New England J. Med. 213: 385-393 (Aug. 29) 1935.
Peet, M. M., and Echols, D. R.: Herniation of the Nucleus Pulposus: Cause of Compression of the Spinal Cord, Arch. Neurol. & Psychiat. 32: 925-932 (Nov.) 1934.
Stockey, B.: Compression of the Spinal Cord Due to Ventral Extradural Cervical Chondromas: Diagnosis and Surgical Treatment, Arch. Neurol. & Psychiat. 20: 275-291 (Aug.) 1928.
Compression of the Spinal Cord and Nerve Roots by Herniation of the Nucleus Pulposus in the Cervical Region, Arch. Surg. 40: 417-432 (March) 1940.
Portugal, J. R.: Hérnia do nucleus pulposus na região cervical, Med. cir. pharm., October, 1943, No. 91, pp. 530-538.
2. Semmes, R. E., and Murphy, F.: The Syndrome of Unilateral Rupture of the Sixth Cervical Intervertebral Disk with Compression of the Seventh Cervical Nerve Root, J. A. M. A. 121: 1209-1214 (April 10) 1943.

were of such severity that the patient desired operation for relief.

The general physical examination revealed nothing significant. The patient was quite husky and robust. There were the scars of an appendectomy and of the scalenotomy. Neurologic examination disclosed that he was tense and anxious. However, he was well aware of his "nervousness" and was quite reliable and consistent in his statements. There was no tenderness of the spine at any point, but hyperextension of the neck invariably initiated the paresthesias in the right forearm. The Naffziger test, using the blood pressure cuff about the neck, also produced the same result. When walking or standing, the patient held the right hand supported in his shirt-front in the napoleonic attitude and said that doing so relieved the paresthesias.

The patient was quite strong and muscular and was right handed. Accordingly, a mild weakness of extension of the right triceps muscle as compared to the left was felt to be significant, though there was no perceptible difference in the triceps reflexes. There was no demonstrable motor weakness of the hand or wrist. The sensory examination showed an area of hypalgesia, hypesthesia and hypothermesthesia over the right thumb and the index and middle fingers and on the radial border of the forearm, as shown in the illustration. Deep sensibility in this area was intact to the usual clinical tests. There was no area of complete analgesia except possibly on the tip of the index finger, but the skin of his hand was thick and horny, and for this reason absolute certainty could not be attained. The remainder of the entire neurologic examination showed normal findings. Laboratory examinations of the blood and urine were all negative, and x-ray films of the cervical spine showed no pathologic changes. On lumbar puncture the initial pressure of the spinal fluid and the alterations produced by compression of the jugular veins were entirely normal. The fluid was clear and colorless. It contained no excess of cells and only 12 mg. of protein per hundred cubic centimeters.

A diagnosis of herniation of the fifth cervical intervertebral disk compressing the right seventh cervical nerve root was made. This region was explored on Dec. 7, 1943 under general anesthesia. The spines and right laminae of the sixth and seventh cervical vertebrae were exposed. A small amount of the inferior part of the sixth and the superior part of the seventh laminae and the ligamentum flavum were removed, exposing the seventh cervical nerve root. It was quite fixed at its exit through the intervertebral foramen by an obvious small protrusion directly anterior to it. When the nerve root was retracted upward there was visible a small herniation. It had the characteristic glistening white dome and felt rubbery. Incision of the posterior spinal ligament over this protrusion resulted in the spontaneous extrusion of the entire piece of herniated cartilage. It measured not over 3 by 3 mm. in diameter. No further loose material was found, and there was no opening into the disk of sufficient size to warrant further search into it. Removal of the small mass left the nerve root quite free and mobile, and the wound was closed.

The postoperative course was uneventful and the patient was almost entirely relieved of his symptoms. None could be induced by any posture, and as soon as testing could be made there was no demonstrable hypalgesia except on the tips of the index finger and the thumb. Even this objective hypalgesia had receded when he left the hospital on the sixteenth postoperative day, and only a sensation of subjective numbness in the tip of the index finger persisted.

SUMMARY

A man aged 41 developed herniation of the intervertebral disk between the sixth and seventh cervical vertebrae on the right side as the result of a fall on an icy street. This gave rise to repeated attacks of severe pain just below the medial part of the spine of the right scapula and persistent paresthesias of the thumb and the index and middle fingers and the radial border of the forearm, all on the right side. Removal of this small piece of herniated cartilaginous material through a partial hemilaminectomy gave immediate complete relief from all symptoms.

3. To eliminate confusion, it would probably be best to speak of the intervertebral disk between the sixth and seventh cervical vertebrae, but since there is no intervertebral disk between the first and second cervical vertebrae it is actually the fifth cervical disk whose extrusion compresses the seventh cervical nerve root at its exit.

FRACTURE OF THE BASE OF THE THUMB

A NEW METHOD OF FIXATION

ERIC C. JOHNSON, M.D., SAVANNAH, GA.
Surgeon, U. S. Public Health Service

Waugh and Ferrazzano¹ and Berkman and Miles² recently reported a new method of treatment of fractures of the metacarpals, exclusive of the thumb. This method consists in reducing the fracture, pushing a Kirschner wire through the fragment and then running the wire on through into the adjacent metacarpal, thus fixing the loose fragment. There is no reason why this same principle cannot be used for metacarpal fractures of the thumb, particularly the Bennett type of fracture involving the base of the thumb.

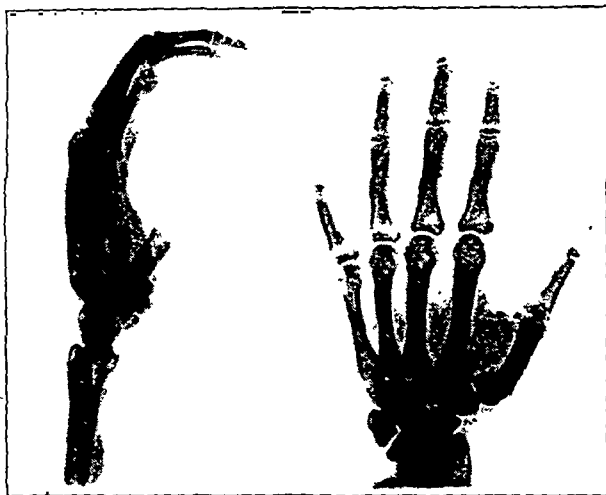


Fig. 1 (case 1).—Fracture of base of thumb.



Fig. 2 (case 1).—Complete reduction with Kirschner wire fixation and cast.

As textbooks and medical journals as far as is known have not described this technic, it is considered worth recording.

Fractures involving the base of the thumb usually give sufficient deformity, discomfort and loss of mobility to warrant the use of a method that will result in a complete anatomic reduction. If the hand is anesthetized and the assistant pulls on the thumb, the fracture can be reduced but the question is how to maintain this reduction. While the assistant is pulling on the thumb in such a manner that the first metacarpal is lined up on the same plane as the second metacarpal, the operator may then introduce a Kirschner wire into the radial side of the metacarpal shaft, just volar to the extensor tendons.

1. Waugh, R. L., and Ferrazzano, G. P.: Fractures of the Metacarpal Exclusive of the Thumb, *Am. J. Surg.* 59: 186 (Feb.) 1943.

2. Berkman, E. F., and Miles, G. H.: Internal Fixation of Metacarpal Fractures Exclusive of the Thumb, *J. Bone & Joint Surg.* 25: 816 (Oct.) 1943.

After the wire has been passed through the shaft and through the first interspace, it is run through the second metacarpal shaft. A small plaster cast can then be applied to the hand and wrist while the assistant is still holding the thumb. The fixation by the Kirschner wire and the plaster cast will maintain

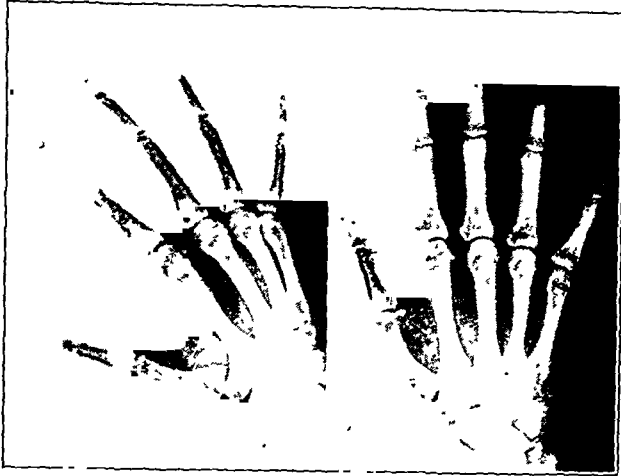


Fig. 3 (case 1).—Result: no deformity, fracture line imperceptible after six weeks.

the reduction. If the operator is not certain that one wire has done the trick, he can insert another wire beside the first one and get a firmer fixation with the two wires.

CASE 1.—On June 11, 1943 R. W., a girl aged 19 years, "grease monkey" at an army air base, was filling a tire when the tire blew up. She sustained a fracture of the base of the first metacarpal of the left hand and a fracture through the head of the third metacarpal and the base of the fourth metacarpal of the right hand. With the patient under general anesthesia a Kirschner wire was passed through the distal end of the second metacarpal and through the fractured head of the third metacarpal of the right hand, and a small cast was applied. The problem of how to treat the Bennett's fracture of the thumb of the left hand was then considered. Since fixation of fragments by the use of Kirschner wire had obtained good results in fractures of the other metacarpals, it was decided to try this method in a fracture of the first metacarpal. The thumb was grasped firmly and pulled out

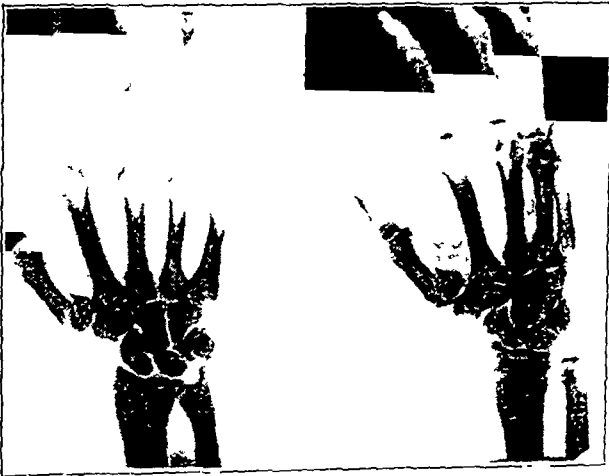


Fig. 4 (case 2).—Comminuted fracture of base of thumb involving joint surface.

and back so as to bring the first metacarpal shaft on the same plane with the second metacarpal shaft. The assistant pressed forward on the back of the second metacarpal and backward on the front of the first metacarpal. A Kirschner wire was then pushed through the midshaft of the first metacarpal and on through the shaft of the second metacarpal. A light cast

was applied. X-ray examination showed that a complete anatomic reduction had been obtained. Within six weeks the fracture was completely healed and the patient had full range of motion, with no deformity.

CASE 2.—On July 3, 1943 J. B., a seaman aged 30 was admitted with a fracture at the base of the first metacarpal of the right hand, following a fist fight. The same method of treatment was used. In this case, since it was not sure that the Kirschner wire had properly impaled the second metacarpal, another wire was inserted and the cast applied. X-ray examination showed that both wires were in good position and that there was an excellent anatomic reduction. Within eight weeks the fracture line was no longer visible and the joints of the thumb were freely mobile and painless.



Fig. 5 (case 2).—Complete reduction by traction; fixation by two pins.

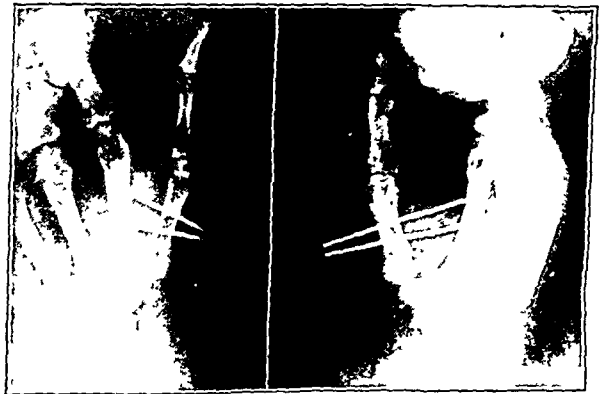


Fig. 6 (case 2).—Result after eight weeks: normal bone and joint contour; fracture line imperceptible

SUMMARY

A simple method for an anatomic reduction of fractures of the base of the first metacarpal has been employed. The convalescence and results of the method have been highly satisfactory both to the patient and to the surgeon.

U. S. Marine Hospital.

Medical Point of View of Criminals.—From the medical point of view, criminals can be classified broadly under the headings of normal, subnormal, mentally defective, psychoneurotic, psychopathic and psychotic. But the groups sometimes overlap, and no psychiatric classification is likely to give entire satisfaction until the dividing line between mental diseases and character anomalies is established with some degree of precision apart from personal estimates.—East, W. Norwood: *The State, the Criminal and the Psychiatrist, Proc. Roy. Soc. Med.* 37:11 (Nov.) 1943.

COUNCIL ON PHARMACY AND CHEMISTRY

At periodic intervals the Council on Pharmacy and Chemistry will offer brief statements on the present status of therapeutic or prophylactic procedure in fields of current interest. This information will be selected for its special value to those engaged in general practice.

Austin E. Smith, M.D., Secretary

COMPARATIVE COST OF VITAMIN MIXTURES

The multiplicity of mixed vitamin preparations that are now available in commerce has created much confusion. According to the promotion claims, each preparation is supposed to be

for which minimum daily requirements have been set. For recognized claims relating to vitamin therapy the physician should consult New and Nonofficial Remedies.

During June 1944 a survey was made of multiple vitamin products offered in one of the largest department stores in the United States. The selling costs and declared contents are tabulated herewith. For purposes of comparison the price rate per hundred capsules or tablets has been based on the package nearest to 100 that is manufactured by the firms. For example, if a manufacturer provides only 50 tablet packages for one dollar, 100 of the tablets are estimated to cost two dollars. Obviously, if any firms who do not now make a package of 100 should decide to do so subsequently, such cost figures may be different—probably lower.

None of the following preparations stand accepted by the Council for inclusion in New and Nonofficial Remedies. Further, the advertising claims offered on behalf of some of the mixtures preclude any possibility of their acceptance. The accompanying table is offered solely to emphasize the importance of examining the labels and of using standard reference sources such as New and Nonofficial Remedies to ascertain recognized actions and uses and to compare these with the profuse and deceptive statements prepared by the more ebullient promoters.

Daily Vitamin Requirements

Vitamin	National Research Council Recommended Daily Allowances †	Food and Drug Administration Recognized Minimum Daily Requirements
A.....	5,000 units	4,000 units
D.....	† units	400 units
B ₁ (thiamine hydrochloride)...	2 mg.	1 mg.
B ₂ (riboflavin).....	3 mg.	2 mg.
Niacin amide (nicotinic acid)...	20 mg.	*
C (ascorbic acid).....	75 mg.	30 mg.

* The minimum daily requirement of nicotinic acid has not been established, but there appears to be fairly good agreement among those qualified to speak authoritatively on the subject that 10 mg. is approximately the minimum daily requirement for this vitamin.

† Applicable to 3,000 calories intake for adult.

‡ 400 to 800 units of vitamin D recommended for pregnancy, lactation and children under one year.

better than all others. Sometimes the claims are based on some unique manufacturing technic, sometimes on the addition of minerals and often on the addition of vitamins other than those

Brands of Vitamin Mixture.

Brand	Vitamin		Thiamine Hydrochloride Mg.	Riboflavin Mg.	Niacin Amide Mg.	C Mg.	Price	
	A Units	D Units					Per Package	Rate per 100
A.B.D. Abbott.....	5,000	500	1	.....	.....	..	\$1.79 for 100 capsules	\$1.79
A B D E C (Parke Davis & Co.)...	5,000	500	2	2	10	75	4.86 for 100 "	4.86
A.B.D.G. Abbott.....	5,000	500	1	0.4	.....	..	2.55 for 100 "	2.55
A.B.D. Hi Potency.....	4,000	400	1	2	10	..	2.98 for 100 "	2.98
A B D O L with Vitamin C (P. D. & Co.).....	5,000	500	1.5	2	20	30	4.23 for 100 "	4.23
A.B.D.O.L. Improved (Parke Davis & Co.).....	5,000	500	1.5	2	.....	..	2.98 for 100 "	2.98
Bax (McKesson).....	5,000	500	1	2	10	30	2.39 for 60 "	4.00
Dayamin (Abbott).....	5,000	800	3	3	20	75	6.95 for 100 "	6.95
Groves ABD.....	4,000	400	1	.....	.....	..	0.98 for 76 "	1.36
Hepicebrin (Lilly).....	5,000	500	1	2	.....	30	3.42 for 100 "	3.42
Multicebrin (Lilly).....	5,000	500	3	2	20	75	4.86 for 100 "	4.86
Pan-Vitex (Testagar & Co.).....	5,000	1,000	10	5	50	100	3.39 for 50 "	6.78
Squibb Special Formula.....	5,000	800	2	3	20	75	5.00 for 100 "	5.00
Stamms (Standard Brands).....	1,667	167	0.333	0.667	3.333	10	1.69 for 96 "	1.76
Stuart Formula (Stuart Co.).....	2,500	400	1.875	1.5	12.5	37.5	2.30 for 96 "	2.40
Unicaps (Upjohn).....	5,000	500	1.5	2	20	37.5	2.96 for 100 "	2.96
Vi Magna (Lederle).....	5,000	500	3	2	20	30	3.19 for 100 "	3.19
Vigran (Squibb).....	4,000	400	1	2	10	30	3.98 for 100 "	3.98
Vims (Lever Bros.).....	1,667	167	0.333	0.667	3.333	10	1.69 for 96 "	1.76
Vipenta Perles "Roche".....	5,000	500	1	0.3	.....	30	3.73 for 100 "	3.73
Visyneral (Adult) (U. S. Vitamin Corp.).....	4,000	570	1.5	2	10	30	8.00 for 200 "	8.00*
Vita-Kap (Abbott).....	5,000	500	1.5	2	20	37.5	4.22 for 100 "	4.22
Vitaminets "Roche".....	1,667	167	0.667	0.667	5	16.67	2.45 for 100 "	2.45
Vitamins plus (Vitamins Plus, Inc.)...	5,000	500	1	2	10	30	4.89 for 144 "	6.80**
White's Multi Vi.....	5,000	500	1	1	10	30	2.70 for 100 "	2.70

* One half or 100 capsules of a 200 capsule package contain minerals only.

** Two types of capsules are required to provide the above vitamins; there are 144 capsules in a package, 72 containing vitamins A and D, 72 the other vitamins.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO 10, ILL.

Cable Address "Medic, Chicago"

Subscription price Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, SEPTEMBER 2, 1944

INDUSTRIAL HEALTH SERVICE FOR FEDERAL EMPLOYEES

Recently hearings were conducted in Washington on H. R. 4909 by the subcommittee of the House Committee on Civil Service. This bill proposes to make available to federal government employees the kind of medical service found generally advantageous to private industry. Dr. Carl Peterson, Secretary of the Council on Industrial Health of the American Medical Association, presented the views of the Council on the essential elements of a good industrial health service:

1. A competent physician who takes genuine interest in applying the principles of preventive medicine and hygiene to employed groups and who is willing to devote regular hours to such service in the working environment.

2. Industrial nurses with proper preparation, acting under the physician's immediate supervision or under standing orders developed by him or by the committee on industrial health of the county medical society.

3. Industrial hygiene service directed at improvement of working environment and control of all unhealthful exposures, to be provided by physicians and others with guidance and assistance from the specialized personnel in state and local bureaus of industrial hygiene.

4. A health program, which should include:

- (a) Prompt and dependable first aid, emergency and subsequent medical and surgical care for all industrially induced disability.

- (b) Health conservation of employees through preventive medicine, physical supervision and health education.

- (c) Close correlation with family physicians and other community health agencies for early and proper management of nonoccupational sickness and injury.

- (d) Good records of all causes of absence from work as a guide to the establishment of preventive measures.

5. Adequate compensation for industrial health personnel.

In respect to treatment, the Council on Industrial Health draws two clear distinctions:

1. Treatment of compensable injuries and diseases: The disabled worker should be free to choose his physician from all those licensed doctors of medicine competent to supply the required services except in situations provided for by chapter III, article VI, section 3 of the Principles of Medical Ethics, which reads as follows:

The phrase "free choice of physician," as applied to contract practice, is defined to mean that degree of freedom in choosing a physician which can be exercised under usual conditions of employment between patient and physician when no third party has a valid interest or intervenes. The interjection of a third party who has a valid interest or who intervenes does not per se cause a contract to be unethical. A "valid interest" is one where, by law or necessity, a third party is legally responsible either for the cost of care or for indemnity. "Intervention" is the voluntary assumption of partial or full financial responsibility for medical care. Intervention shall not proscribe endeavor by component or constituent medical societies to maintain high quality of service rendered by members serving under approved sickness service agreements between such societies and governmental boards or bureaus and approved by the respective societies.

2. Treatment of noncompensable injuries and diseases: The treatment of injuries or diseases not industrially induced is the function of private medical practice. The physician in his industrial relationships should abstain from such services except in the case of:

- A. Minor ailments. The physician in industry may treat minor physical disorders which temporarily interfere with an employee's comfort or ability to complete a shift, and for the relief of which he may need immediate medical attention.

- B. First aid for urgent sickness. The physician in industry should employ such measures as the emergency dictates in all cases of urgent sickness occurring during working hours on the working premises, until such time as prompt notification of the family physician relieves him of further responsibility.

- C. Rehabilitation after sickness and injury. The physician in industry can properly assume responsibility for those phases of rehabilitation after disability industrially induced or otherwise which progress best under controlled working conditions.

Examination of the bill indicated that its proposals did not diverge greatly from the Council's position. During the hearings the committee seemed to be genuinely concerned about the values to be received from such expenditure of public funds, specifically reduction of lost time from sickness, improved production and improved personnel relations. Representatives of man-

agement, labor and medicine who testified were all in general accord that these benefits commonly observed in industry should prevail with equal force in the government. There was objection to the proposal that these industrial health services be set up only on recommendation of the Civil Service Commission after consultation with the United States Public Health Service. The alternative recommendation was that each agency be responsible for its own health program but that each agency may secure medical services by agreement with the Public Health Service. The committee particularly asked for reassurance that a health program of this kind would supplement rather than supplant the activities of the private physician. The general tone of the hearings lent encouragement to the hope that a health service could be organized for government workers along lines which experience in private industry has proved dependable and successful.

THE MODE OF ACTION OF THE SULFONAMIDES

During the course of the development of sulfonamide chemotherapy many theories have been propounded relative to the fundamental mode of action of these agents. A recent review by Henry¹ discusses certain of the existing theories. Early belief that the sulfonamides stimulate the defensive powers of the host or inactivate bacterial toxins are, in light of present knowledge, rather questionable. The primary action of these drugs is now generally agreed to be on the bacteria themselves, and the important manifestation of this action is bacteriostasis. How then do the sulfonamides act on bacteria to inhibit their growth?

The assumption that the sulfonamides are oxidized in the body to their hydroxy derivatives led to the so-called anticatalase theory of their mode of action. This theory assumed that bacteria convert sulfonamides to hydroxy derivatives, which inhibit the enzyme catalase. The absence of this enzyme was supposed to allow the hydrogen peroxide from bacterial metabolism to accumulate to a point at which it inhibited bacterial growth. This theory was discredited by the subsequent observations that certain bacteria are inhibited by sulfonamides (*a*) in the absence of catalase (*b*) even though they do not produce peroxide (*c*) although they are peroxide resistant and (*d*) in the absence of conditions necessary for the production of peroxide (i. e. anaerobic organisms).

As a result of the now extensively confirmed observation that para-aminobenzoic acid inhibits the sulfonamide effect, a currently popular theory of the mode of action of the sulfonamides developed. This theory is based on the assumption that para-aminobenzoic acid is an essential metabolite for bacterial growth, participat-

ing in the formation of certain vital enzyme systems. It was claimed that the sulfonamides, because of close chemical similarity to para-aminobenzoic acid, were capable of forming ineffective substitutes for this essential metabolite in vital enzyme systems. This theory has done much to further our knowledge of the pharmacology of the sulfonamides. However, the failure of this theory to explain certain recent observations has led to a rather critical reexamination of its claims. If the para-aminobenzoic acid theory is valid, then the widespread effectiveness of the sulfonamides as cell inhibitors would indicate that para-aminobenzoic acid is an almost universally essential metabolite. This, however, remains to be shown positively. According to Henry, para-aminobenzoic acid has been demonstrated to be an essential metabolite for only one of the pathogenic bacteria, the diphtheria bacillus. A number of other inhibitors of the sulfonamides, such as certain purines, amino acids, glucose, mercuric chloride and urethane, have now been demonstrated. If the logic of the para-aminobenzoic acid theory is established, these substances should also be considered essential metabolites, a view that is obviously fallacious with regard to certain of these inhibitors.

Finally, it was observed in a charcoal model that para-aminobenzoic acid can competitively inhibit the action of the sulfonamides without in itself being an "essential metabolite." Sulfanilamide inhibits the adsorption of methylene blue by charcoal and is in turn inhibited in this respect by para-aminobenzoic acid. Para-aminobenzoic acid therefore effectively antagonizes most of the actions of the sulfonamides, with the exception of certain toxic actions in mammals. The method of this antagonism is not well understood, and its direct relationship to the mode of action of the sulfonamides is somewhat questionable. The sulfonamides inhibit various of the known respiratory enzyme systems. The inhibition of bacterial multiplication bears a direct relationship to the inhibition of respiratory mechanisms of these bacteria, either aerobic or anaerobic.

A recent theory of the mode of action of the sulfonamides postulates that their chemical similarity to the whole or part of various coenzyme molecules allows them to combine with the specific proteins of the respiratory enzymes with either the displacement of the coenzyme by the drug or the formation of an inactive "drug-protein-coenzyme" complex.

A substantial fraction of the overall oxygen consumption of the cell still remains when cell division is completely stopped by the sulfonamides. Henry has therefore suggested that the action of the sulfonamides on bacteria resembles the action of certain narcotics, especially in regard to the more or less specific inhibition of that relatively small portion of the total respiration concerned with supplying the energy for cell division.

1. Henry, Richard J.: The Mode of Action of the Sulfonamides, *Bact. Rev.* 7: 175, 1943.

The specific cellular respiratory enzyme systems against which the sulfonamides act have not as yet been clearly identified, nor has the manner in which these systems are altered been portrayed.

CHEMOSURGICAL TREATMENT OF CANCER OF THE LIP

The chemosurgical method was introduced by Mohs¹ for the excision of accessible forms of cancer under microscopic control. The tissues in question are fixed in situ by means of a suitable solution of zinc chloride and then excised and examined microscopically. This process is repeated if necessary until microscopically cancer free surfaces are reached. The fixation of the tissue by the zinc chloride does not interfere with the microscopic work. A special clinic was established in the department of surgery in the University of Wisconsin eight years ago, and since then many hundreds of cases of cancer have been subjected to the chemosurgical treatment. The results are now becoming available for analysis and evaluation. The first report on these results deals with cancer of the lip.²

The report covers the cases treated between July 7, 1936 and May 29, 1943. The cure rates are 91.5 per cent of 164 cases after six months, 59 per cent of 73 cases after three years and 87.5 per cent of 38 cases after five years. The cure rate of 87.5 per cent after five years appears to surpass recently published rates for surgical and radiotherapeutic methods of treatment of cancer of the lip, but of course these rates are not based on sufficiently standardized material to yield strictly comparable results. This is particularly the case with respect to radiotherapy by standardized methods in expert hands.

There would seem to be no question, however, as to the value of the chemosurgical method. The microscopic control of excision gives the method an unequaled advantage—"time after time, unsuspected outgrowths of small caliber, from the main tumor mass were found microscopically, at times extending a considerable distance after becoming grossly invisible." The method is practically without risk, it conserves lip tissue and it has no tendency to cause metastasis. As a rule regional metastasis must be removed by standard surgical dissection. "Chemosurgical treatment is particularly advantageous for cancer of the lip recurrent after surgical operation or irradiation. Such lesions often respond poorly to repetition of the original therapy, but they almost invariably respond to chemosurgical treatment." The chemosurgical method of treating cancer is another example of the value of expert specialization along a particular line. Further practical progress requires special training and facilities.

THE INTERNATIONAL LABOR ORGANIZATION ON SICKNESS INSURANCE

Possibly the action of the International Labor Organization at its twenty-sixth conference in Philadelphia during April and May of the present year may have a greater influence on sickness insurance legislation than any of the laws proposed in Congress.¹ Delegates from forty-one nations composed this conference, including nearly all Allied and neutral nations except the Soviet Union. There are four representatives from each nation. Two of these are appointed by the government, and one is chosen by employer and the other by labor organizations.

The recommendations for sickness insurance are more elaborate than those of any previous conference. They constitute a complete outline for legislation; if previous experience points to future possibilities, these recommendations are likely to be followed in legislation introduced in nearly all the countries not having sickness insurance at the present time. Some of the features in the recommended legislation especially suggested are as follows:

The medical care service should cover all members of the community, whether or not they are gainfully occupied.

All care and supplies should be available at any time and without time limit, when and as long as they are needed, subject only to the doctor's judgment and to such reasonable limitations as may be imposed by the technical organization of the service.

Complete and up to date technical equipment for all branches of specialist treatment, including dental care, should be available, and specialists should have at their disposal all necessary hospital and research facilities and auxiliary outpatient services such as nursing, through the agency of the general practitioner.

To achieve these aims, care should preferably be furnished by group practice at centers of various kinds working in effective relation with hospitals.

The working conditions of doctors and members of allied professions participating in the service should be designed to relieve the doctor or member from financial anxiety by providing adequate income during work, leave and illness and in retirement, and pensions to his survivors, without restricting his professional discretion otherwise than by professional supervision, and should not be such as to distract his attention from the maintenance and improvement of the health of the beneficiaries.

The professional supervision of the members of the medical and allied professions working for the service should be entrusted to bodies predominantly composed of representatives of the professions participating with adequate provision for disciplinary measures.

The central government agency should consult the representatives of the medical and allied professions, preferably through advisory committees, on all questions relating to the working conditions of the members of the professions participating, and on all other matters primarily of a professional nature, more particularly on the preparation of laws and regulations concerning the nature, extent and provision of the care furnished under the service.

Group medical service is recommended, and governments are urged to provide equipment for medical centers. The use of salaried physicians is recommended under certain circumstances.

1. Mohs, F. E., and Guyer, M. F.: Preexcisional Fixation of Tissues in the Treatment of Cancer in Rats, *Cancer Research* 1: 49 (Jan.) 1941.
Mohs, F. E.: Chemosurgery: A Microscopically Controlled Method of Cancer Excision, *Arch. Surg.* 42: 279 (Feb.) 1941.
2. Mohs, F. E.: Chemosurgical Treatment of Cancer of the Lip: A Microscopically Controlled Method of Excision, *Arch. Surg.* 48: 478 (June) 1944.

1. International Labour Conference, Provisional Record, 26th Session, Philadelphia No. 30, *Social Security Bulletin* 7: 11 (June) 1944; *Monthly Labor Review* 59: 1 (July) 1944.

The health sections were adopted by a vote of 76 to 6, with 23 extensions. The attitude of one of the employers' representatives, Henry I. Harriman of the United States, who voted against the health section, was expressed as follows:²

The employers' group was frankly surprised at the universality of the demand for all-inclusive social security legislation. It was their feeling, as it is mine, that such laws must come as a matter of evolution and I personally voted against the final resolution, feeling that it went too far and too fast.

Now that I am back from Philadelphia and have had an opportunity to view the conference with better perspective, I feel that the employers of the United States must face the demand for enlarged social security and that if they are wise they will not try to stop the enactment of such laws but will guide them into sound and reasonable form.

Current Comment

POLITICAL CARE OF THE MENTALLY ILL IN NEW YORK

When an epidemic of amebic dysentery occurred in the Creedmoor State Hospital in New York in March 1943, Gov. Thomas E. Dewey appointed a commission to investigate the management and affairs of the Department of Mental Hygiene of the State of New York and the institutions operated by it. That report,¹ which has just been made available, emphasizes again the defects that seem inseparable from political medicine. In 1942 New York mental hospitals were caring for 83,053 patients at an annual cost of \$30,474,048.08. The commission found everywhere signs of inadequate examination of mental defectives, unsatisfactory recording of physical conditions on admission and lack of professional care, owing largely to the use of an undermanned professional staff. "The emphasis in all the institutions has been on administration at the expense of clinical medicine," says the report. This is the familiar criticism of all types of political medicine. In the mental hospital service in New York State advancement went to "careerists" and not to the psychiatrists of wide experience and knowledge. New methods of treatment such as shock and physical therapy disturbed the routine of the institutions and were therefore neglected. The report indicates that this service had not attracted competent physicians. Nurses were insufficient in numbers and defective in quality and were assigned to administrators and their families rather than to patients. The diets were monotonous and were not supervised by dietitians. Research and education were neglected or isolated in bureaucratic subdivisions apart from the treatment of patients. Here were all the apparently inevitable evils of mass medical treatment. Here were all the faults that usually accompany compulsory political care. Here, in miniature, is a picture of what the American people may expect if political medicine ever takes over general medical care in this country.

WALTER REED AND YELLOW FEVER

The investigations on tropical disease now being made all over the world focus attention again on the original experiments conducted under the direction of Walter Reed, which set the pattern for this type of study. In this war members of our armed forces have been decorated for their services as volunteers in the study of sandfly fever and other unusual conditions. When Reed and Carroll landed in Cuba in June 1900, Dr. Walter Reed came to live at the post hospital in Columbia Barracks. He found as executive officer on duty Lieut. Albert E. Truby, later retired as brigadier general. In 1943 General Truby assembled the records and reports of the Yellow Fever Commission and told the story which will be for all time one of the epics in the history of medicine.¹ The Reed board began its work on June 25, 1900. The story of the self sacrifice, the difficulties that they encountered, the tragedy of the death of Lazear have all been reflected in many a magazine article, in books, in plays and in motion pictures. The Truby account is exceptional because it is so fully documented and because it is really a first hand report. In view of the place that malaria has come to occupy in the present war, it is interesting to read in the annual report of General Leonard Wood to the Secretary of War, June 30, 1901, the following statement:

With the acquisition of our recent knowledge of the propagation of malarial fevers, it may be taken for granted that this preventable disease will be hereafter greatly reduced and, at most posts, practically eliminated. As an instance, for the week ending June 23, 1900 there were 34 cases of malarial fever under treatment at Rowell Barracks, Cuba (Cienfuegos). A year afterward, for the week ending June 22, 1901, chiefly in consequence of sanitary measures promoted by the post surgeon, Lieutenant A. E. Truby, there was not a single case.

HIGH COST OF VITAMIN THERAPY

Elsewhere in this issue (page 29) appears a statement from the Council on Pharmacy and Chemistry on the Comparative Cost of Vitamin Mixtures, which should help explain the \$179,000,000 spent for vitamins in 1943. Those who are familiar with the true indications for vitamin therapy already realize how many hundred million dollars are spent needlessly; others have only to glance at the Council's report. As the report reveals, the individual costs of vitamin mixtures vary greatly, almost as much as the promoted claims. No group of agents is now subjected to greater advertising abuse than vitamins. The radio, newspapers, store counters and other mediums constantly attract the ear and eye with pleas to improve the health, correct constipation, avoid dizzy spells and be successful with love and business affairs. How? Simply by taking vitamins according to the promoters! Fortunately there are bodies such as the Council on Pharmacy and Chemistry to set forth in succinct fashion the basic claims that may be made for vitamins. Such publications of the Council as New and Nonofficial Remedies present the scientifically recognized actions and uses of vitamins. This information should be spread widely.

2. Best's Insurance News 45: 27 (Aug.) 1944.

1. The Care of the Mentally Ill in the State of New York. A Report by a Commission Appointed by Honorable Thomas E. Dewey, Governor of the State of New York, Pursuant to Section 8 of the Executive Law, to Investigate the Management and Affairs of the Department of Mental Hygiene of the State of New York and the Institutions Operated by It. Paper. Pp. 124, with 3 illustrations. New York, 1944.

1. Memoir of Walter Reed: The Yellow Fever Episode, by Albert E. Truby, Brigadier General, U. S. Army, Retired, New York, Paul B. Hoeber, Inc., 1943.

MEDICINE AND THE WAR

ARMY

INVESTIGATION OF JAPANESE MEDICAL DEPOTS ON BIAK ISLAND

Captain Earl W. Schafer

Squadron Flight Surgeon

MEDICAL CORPS, ARMY OF THE UNITED STATES

In a previous report I submitted information concerning an investigation of Japanese medical depots at a recently evacuated air strip in New Guinea. On the beachhead at Biak Island I had the opportunity to investigate four Japanese medical depots. At this time the Japs were still holding the air strips on the island.

The depots were situated along a road leading from the beach and were in the most part intact. They were large huts with a thatched roof and metal sides. The supplies were all in wooden packing cases stacked neatly in piles.

In the previous report a number of drugs and evidence of certain laboratory and x-ray equipment were listed. In addition to the drugs seen on New Guinea there were atropine sulfate crystals, iodoform crystals, magnesium sulfate crystals, thrombogen (Fiji), digitaminum, stibnal solution in 20 cc. ampules, sodium citrate solution, glacial acetic acid, phenol, lead acetate and concentrated iodine solution. The drugs were identified by the English or Latin names on the containers in addition to the Japanese. There were many items which could not be identified, but the same precision in packing and the predominance of glass containers were noted.

One of the most interesting and speculative biologic preparations found was many packing cases full of ampules of male sex hormone. Anthrax vaccine and antitetanic vaccine were found, also pound jars marked "Vitamin A and D Ointment" in large English letters.

Complete kits packed neatly with cotton in cardboard boxes 1 foot square, sealed in rubber bags and then tied with vines were noted in great numbers. Two of these kits were packed in a heavy wooden box. The kits contained a variety of drugs, bandages, intravenous saline solution (500 cc.), a quart of alcohol, a small rectangular metal box with a 20 cc. glass syringe and needles. The latter were each placed in the end of a small metal tube, two needles to the tube.

Because of high cliffs honeycombed with caves and close to the beachhead, large numbers of Japanese soldiers were able to withdraw into these natural fortresses. Later after artillery and naval bombardment, dive bombing, strafing and flame throwers were employed the majority of the enemy were disposed of. Medical supplies were found in many of the caves.

Quantities of saki and Kirin beer were captured. The quartermaster gave one issue of the latter to each of the units. The product proved to be as palatable as any American brand in the long long ago.

NEW NAME IS SELECTED FOR MORALE SERVICES DIVISION

The name of the Morale Services Division, Army Service Forces, has been changed to the Information and Education Division in order to describe more accurately its increasingly important functions. There will be no change in functions or personnel. First established in 1940 as a branch of the Adjutant General's Office, the Information and Education Division is now providing a worldwide service of information to troops as well as off duty educational programs. In addition to its headquarters in Washington, D. C., the division maintains offices in New York City and in Los Angeles. Its military personnel are in every theater where our troops are stationed.

The division, under the direction of Major Gen. Frederick H. Osborn, is charged with the planning and supervision of matters not pertaining to command which relate to the maintenance and improvement of morale within the Army. It conducts research studies through attitude surveys and performance

data designed to furnish information to serve as a guide in problems of military leadership. It supervises the publication of *Yank*, the army weekly, and 2,023 other army newspapers, operates the largest correspondence school in the world, the United States Armed Forces Institute, which is helping 225,000 men and women of all the armed services prepare themselves for better jobs on their return to civilian life, and produces forty-two hours of transcribed entertainment and educational radio programs weekly for use by more than four hundred overseas radio outlets.

In addition, the Information and Education Division produces and distributes information and educational movies, directs army orientation courses and off duty discussion programs and prepares "short guides" to foreign countries to which our troops may be sent.

ARMY AIR FORCES CONFERENCE ON RHEUMATIC FEVER

A recent conference on rheumatic fever was held by the Army Air Forces in Denver. The objectives of the meeting were outlined by Col. William P. Holbrook, chief, Professional Division, Office of the Air Surgeon. Colonel Holbrook also discussed some of the unsolved problems of rheumatic fever which must be met during the next year. The report of the Committee on the Prophylactic Use of the Sulfonamides indicated that these drugs should be used in treatment only as a last resort and that their principal indication is for prophylaxis. The report of the Committee on Criteria for the Diagnosis of Rheumatic Fever contained recommendations based principally on the paper given by Dr. T. Duckett Jones at the Chicago session of the American Medical Association in June. The important recommendations of the Committee for Standardization of Convalescent Care of Rheumatic Fever were that no patient should be discharged to duty until he had actually undertaken duty under supervision in the convalescent center and that this duty should be in accord with his military occupational specialty.

PRISONERS OF WAR

Major Edwin S. Kagy is a prisoner of war of the Japanese and is now in a prison camp in Tokyo. Dr. Kagy is a graduate of Tulane University of Louisiana School of Medicine, New Orleans, in 1934. He was commissioned in the regular Medical Corps of the Army in August 1935 and was ordered to the Philippines in the fall of 1940. He was at Corregidor when Bataan fell and was taken prisoner. In the fall of 1943 he was transferred from the Philippines to Tokyo.

Lieut. Edwin Tucker, formerly of New Orleans, has been a prisoner of the Japanese since the fall of Bataan. Dr. Tucker graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1936 and entered the service July 2, 1941.

Capt. Peter C. Graffagnino, who was recently reported missing, is now a German prisoner. Dr. Graffagnino is a graduate of Tulane University of Louisiana School of Medicine, New Orleans, 1939. He entered the Army Medical Corps in September 1941.

COLONEL BLECKWENN APPOINTED NEUROPSYCHIATRIC CONSULTANT

Col. William J. Bleckwenn, professor of neuropsychiatry at the University of Wisconsin Medical School, Madison, has been appointed as the neuropsychiatric consultant to the Sixth Service Command with headquarters in Chicago. Dr. Bleckwenn recently returned from a period of over two years' service in the South Pacific, having gone out in command of a medical regiment. Later he served as a base area surgeon. He graduated from Columbia University College of Physicians and Surgeons, New York, in 1920 and entered the service Jan. 13, 1941.

TWO THIRDS OF ARMY WOUNDED RETURNED TO DUTY

According to a recent release, fully 96 per cent of all men wounded on battlefields recover, and of these about two thirds return to duty. When the convalescent period is reached the Army's new intensive program of reconditioning begins. This includes planned, progressive physical exercise to speed the recovery of strength and stamina. Occupational therapy encourages normal habits, and educational therapy mental advancement. Following the reconditioning program the men who have recovered but who do not meet the Army's physical standards for general service may remain in the Army in limited service status or in some cases may return to civilian life. Twenty-three per cent of those discharged from hospitals with serious physical limitations, and who were given the option of discharge from the Army, elected to remain in the military service, according to War Department figures for the period from June 25 to July 25. Continued hospital care as required will be available to casualties returned to civilian life, together with opportunity for vocational rehabilitation or academic advancement through study in schools and colleges, depending on circumstances and personal choice.

ARMY OPENS MALARIA TREATMENT CENTER

The Moore General Hospital, Swannanoa, N. C., has been designated a medical center for the study and treatment of tropical diseases under the command of Lieut. Col. Joseph M. Hayman of Cleveland. It was opened on September 1. There are 350 beds in this center for patients who are receiving active treatment, and in addition there are barracks facilities for 1,100 men for the reconditioning program. On release from bed treatment the patients will be transferred to the reconditioning barracks and continue any further treatment required in addition to the training needed to prepare for active duty again. As far as possible all tropical disease patients in the Army will be concentrated at the new center. Particular attention will be paid to malaria and filariasis. Facilities for expansion of bed capacities as required are being provided. The new center will be under the supervision of Lieut. Col. Francis R. Dieuaide, chief of the Tropical Disease Branch of the Medicine Division of the Surgeon General's Office, headed by Brig. Gen. Hugh J. Morgan.

CONSERVATION OF MEDICAL CORPS OFFICERS

The Adjutant General of the Army has recently issued a circular that will effect the strictest economy in the utilization of Medical Corps officers.

Tables of organization are changed by this order so that many positions that do not require the professional knowledge or skill of medical officers may now be filled by properly qualified Medical Administrative or Sanitary Corps officers. Such changes refer largely to duties of an administrative, executive or training nature.

Under the new provisions it is believed that Medical Corps officers will be more fully utilized for their technical knowledge and professional skill than in the past.

CAPTAIN ROBERT WARE MISSING

Capt. Robert B. Ware, formerly of Lynchburg, Va., has been reported missing in action since D day. Dr. Ware graduated from the Medical College of Virginia, Richmond, in 1940. He volunteered for duty and was called July 1, 1940. He attended officers' school at Carlisle Barracks, Pennsylvania, and has been overseas since Sept. 27, 1942.

MEDICAL DEPARTMENT ANNIVERSARY

The Army Medical Department observed on July 27 its 169th anniversary of the establishment of the first medical service for the American Army. The Medical Department had its inception in the creation by the Continental Congress on July 27, 1775 of a hospital for the American forces shortly after George Washington assumed command in the Revolutionary War.

ARMY AWARDS AND COMMENDATIONS

Colonel Edward J. Tracy

The Legion of Merit was recently awarded to Col. Edward J. Tracy, formerly of Albuquerque, N. M. The citation accompanying the award read "For service as Surgeon, VIII Bomber Command, from Aug. 11, 1942 to Jan. 6, 1944. He directed the expansion of medical service for personnel of this command from one group to a large number of groups. Through his foresight and initiative he overcame the problems of sanitation and care and evacuation of casualties which arose from this rapid expansion during a relatively short period. He instituted the policy of flight surgeons accompanying their units on operational crews under their care. He himself participated in several operational missions in order to gain information and better to evaluate the stress and strain to which combat personnel are subjected. The immediate knowledge gained by him enabled him to make recommendations to the commanding general, VIII Bomber Command, as to the limits imposed by the human factor and as to the policies to be adopted on leaves, passes and furloughs and related matters affecting morale. He also kept abreast of modern methods of treatment and use and care of protective flying equipment, applying these new methods whenever practicable. The initiative, skill and sound judgment displayed by him have contributed immeasurably to the combat achievement of the VIII Bomber Command." Dr. Tracy graduated from the University of Minnesota Medical School, Minneapolis, in 1930 and entered the service after graduation from the Army Medical School in 1932.

Captain Joseph E. Sokal

The Bronze Star Medal was recently awarded to Capt. Joseph E. Sokal for "meritorious achievement in connection with military operations against the enemy at Makin Atoll, Gilbert Islands, Nov. 20-21, 1943. Captain Sokal set up an aid station under extremely adverse conditions and under constant enemy sniper fire. From this position he administered medical treatment to approximately 100 men. He was tireless in his efforts to aid the wounded and by his diligent application of professional skill saved many lives." Dr. Sokal graduated from Yale University School of Medicine, New Haven, Conn., in 1940 and entered the service after completion of his internship in 1941. Besides the Gilbert Islands campaign he took part in the recent landing of Saipan. Dr. Sokal was also commended for his loyal cooperation, untiring zeal and unselfish devotion to duty during the Gilbert campaign; he has also been cited for the Silver Star.

Captain William E. Nunnery

The Soldier's Medal was recently awarded to Capt. William E. Nunnery "for heroism at March Field, California, on Feb. 1, 1944, when an army airplane made a forced landing and caught fire. An officer of the combat crew was pinned in this airplane. An explosion of the gas tanks was expected at any minute. Captain Nunnery, who was approximately 300 to 500 yards from the scene of the airplane at the time of its crash, immediately proceeded thereto and on arriving at the then burning airplane heroically and with utter disregard for his own safety assisted in extricating an officer crew member who was trapped and seriously burned." Dr. Nunnery graduated from the University of Kansas School of Medicine, Kansas City, in 1942 and entered the service in July 1943.

Captain Benjamin I. Schneiderman

Capt. Benjamin I. Schneiderman was recently awarded the Bronze Star. The citation that accompanied the award read in part "For heroic achievement in the action of 12 February 1944 near Anzio, Italy. During an enemy air attack on the Anzio-Nettuno beachhead area, Captain Schneiderman remained at his post of duty even though flak was falling throughout the hospital. Disregarding the extreme danger, he performed one operation after another. Bombs fell in the hospital area and shell fragments pierced the operating tent, yet he continued to perform his duties in a cool and efficient manner. His courage and devotion to duty reflect credit on himself and the Medical Corps." Dr. Schneiderman graduated from New York University College of Medicine, New York, in 1939 and entered the service in May 1942.

NAVY

NAVAL HOSPITAL IN ENGLAND TREATS
HUNDREDS OF WOUNDED FIRST
TWO WEEKS OF INVASION

At a U. S. naval hospital in England, several hundred U. S. casualties from France were treated with the loss of only 1 man. Formerly a British hospital, this institution is a quarter of a mile long, is three stories high with more than a hundred wards, operating rooms and laboratories, and is maintained in a state of constant readiness. Sixty outbuildings can be utilized in emergencies, almost doubling the normal capacity. The hospital maintains a staff of 50 doctors, 12 hospital corps officers serving as technicians, 98 trained navy nurses and 400 skilled hospital corpsmen. Another 180 men are engaged in maintenance. On D day the supply of medicine and drugs included 537,500 cc. of plasma, 398,500 cc. of other intravenous solutions, 794 gallons of alcohol, 50,000 tablets of sedatives of various types, 143,500 sulfonamide tablets and 71 pounds of sulfonamide powders, 50,300,000 units of penicillin, 299 pints of medicinal whisky, 4,958 bandages of all types, plus orthopedic equipment including 5,326 pounds of cotton, 2,500 pounds of plaster of paris, 100,000 yards of crinoline and 200 rolls of sheet wadding.

Each casualty on arrival at this hospital is examined separately by the chiefs of surgery, medicine and neuropsychiatry to determine as quickly as possible the preliminary treatment necessary and whether surgery is needed. After preliminary examinations and treatment each man is bathed, shaved, issued clean clothes and put into a clean, comfortable bed in rooms staffed twenty-four hours a day.

Complete arrangements for the transfer of this hospital from British to American hands began last fall, when Rear Admiral Luther Sheldon Jr., Medical Corps, U. S. N., assistant chief of the navy's Bureau of Medicine and Surgery, arrived in the United Kingdom. Early in the spring Capt. C. J. Brown, formerly of Philadelphia, brought his staff over to assume command. Capt. J. W. Miller, formerly of Washington, D. C., is executive officer. Other members of the medical corps on the staff are Capt. James M. Faulkner, Brookline, Mass., chief of medicine; Capt. A. H. Weiland, Coral Gables, Fla., chief of orthopedic surgery; Comdr. Henry W. Hudson, Waban, Mass., chief of surgery, and Comdr. Robert T. Baldrige, Providence, R. I., chief of the urology department.

MEDICAL COMPANY COMMENDED FOR
MERITORIOUS SERVICE

Company C, Third Medical Battalion, attached to the Third Marine Division, Reinforced, in the capture of a beachhead on Bougainville Island, has been commended by Major Gen. Roy S. Geiger, U. S. Marine Corps, commanding general of the First Marine Amphibious Corps. The citation reads "During the military operations commencing Nov. 1, 1943, which resulted in the capture by the Third Marine Division, Reinforced, of a beachhead on Bougainville Island, British Solomon Islands, Company C, Third Medical Battalion, made conspicuous and valuable contributions to the success of our arms. At the battles of Cape Torokina, Koromokina Lagoon, the Coconut Grove, Piva, Piva Forks and Fry's Nose, as well as during enemy bombing attacks and combat operations of a minor nature, the personnel of the company brought aid to the wounded under the most adverse conditions of weather and jungle terrain, cheerfully enduring enemy fire throughout each of these actions and frequently risking their own lives in order to evacuate and administer medical assistance to the injured during the heat of combat. The officers and men of the company acquitted themselves gallantly, winning the admiration of the combat troops and saving the lives of hundreds of the wounded."

The commanding officer of the company was Lieut. Comdr. Rodney Robert Gleysteen. Dr. Gleysteen graduated from the State University of Iowa College of Medicine, Iowa City, in 1938 and entered the service Aug. 15, 1941.

Other Medical Corps officers with this company were Lieut. Leo John Koscinski, Chicago, who graduated from Northwestern University School of Medicine, Chicago, in 1941 and entered the service April 13, 1942; Lieut. Charles Reid Goodwin, Port Arthur, Texas, who graduated from the University

of Texas Medical Branch, Galveston, in 1940 and entered the service in October 1942, and Lieut. Frederick Gordon Grant, Scotia, N. Y., who graduated from the University of Rochester School of Medicine and Dentistry, New York, in 1940 and entered the service in September 1942.

NAVAL HOSPITAL PROGRAM TO
BE EXPANDED

Southern California, the Navy's largest medical center with more than 17,000 navy marine and coast guard men as patients in hospitals in this area, has an expansion program under way, including recommissioning of former navy hospitals at Spadra, Beaumont and Banning. In anticipation of increased intensity in Pacific warfare, additions are being made at several of the navy hospitals in southern California and work is under way to recommission the former army hospitals at Spadra, Beaumont and Banning. The three convalescent hospitals at Spadra, Beaumont and Banning now are being made ready for more than 3,000 patients. The hospital at Spadra will be commanded by Capt. Harold L. Jensen as an annex to the Corona hospital, also under his command. Spadra was formerly a state medical center. It has been adapted for service use with several temporary buildings added to the permanent structures erected by the state. The Corona hospital, formerly a luxurious hotel, is one of the nation's most beautiful medical centers. It has been named the rheumatic fever center for the Navy and is the largest navy tuberculosis center on the West Coast. An almost separate hospital within the hospital has been opened to treat cases of tuberculosis.

NAVY AWARDS AND COMMENDATIONS

Lieutenant William B. Neal Jr.

The Navy and Marine Corps Medal was awarded to Lieut. William B. Neal, formerly of Chicago, "for distinguishing himself by heroism while attached to the U. S. S. *Lansdale* during and following an attack by enemy aircraft off the coast of Algeria on the night of April 20, 1944. When the *Lansdale* was damaged and the ship subsequently sank, Lieutenant Neal was severely injured by the shock of the initial explosion but promptly commenced rendering first aid to other casualties of the disaster. With great skill and the utmost fortitude, he continued administering medical assistance until after the order had been given to abandon ship. When removed from the water by a rescue vessel he was completely exhausted but within a short time resumed his untiring efforts to revive survivors and care for the wounded for over thirty-six hours, at which time it became necessary to hospitalize him. He undoubtedly contributed to the saving of several lives. The extraordinary courage, selflessness and devotion to duty displayed by Lieutenant Neal were in keeping with the highest traditions of the Naval Service." Dr. Neal graduated from the University of Chicago School of Medicine in 1941 and entered the service in August 1943.

Commander Emil Edward Napp

Comdr. Emil Edward Napp, formerly of New Rochelle, N. Y., was awarded the Silver Star Medal "for conspicuous gallantry and intrepidity as a regimental surgeon during the seizure and occupation of Japanese held Cape Gloucester, New Britain, from Dec. 26 to 31, 1943. Accompanying assault troops into the zone of action on numerous occasions throughout this hazardous period, Commander Napp repeatedly risked his life in order to care for injured personnel and supervise their evacuation from front lines to battle aid stations, in one instance ministering medical aid to a wounded marine while pinned down by Japanese sniper fire. By his keen foresight in anticipating material needs of casualties in the field of battle and his outstanding skill, Commander Napp contributed to the saving of many lives. His professional integrity and daring courage in the face of grave peril were in keeping with the highest traditions of the United States Naval Service." Dr. Napp graduated from New York Medical College, Flower and Fifth Avenue Hospitals, New York, in 1933 and entered the service June 9, 1941.

MISCELLANEOUS

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Combined Wartime Graduate Medical Meeting and Regional Meeting of the American College of Physicians, Hotel Vancouver, Vancouver, B. C.: The Recent Status of Rickettsia Disease, Dr. Matthew Riddle; Control of Staphylococcal Infections with Sulfonamide Drugs, Lieut. Col. Roy H. Turner; Clinical Experience with Penicillin, Capt. Charles E. Watts; Some Pharmacologic Problems in the Use of Chemotherapeutic Drugs, Dr. Norman D. Davis; luncheon address, Major Gen. G. R. Pearkes; Respiratory Limitations in Altitude Flying, Group Capt. G. E. Hall; Respiratory Disease Problems in an East Coast Base, Surg. Comdr. J. Wendell MacLeod; Visualization of the Chambers of the Heart and Great Vessels, Lieut. Comdr. Israel Steinberg; Experimental and Clinical Aspects of Carotid Sinus Reflexes, Dr. Hance Haney; dinner addresses, Dr. David P. Barr and Comdr. Corydon M. Wassell, September 14.

Hepatitis, Lieut. Col. Roy H. Turner; Psychosomatic Medicine, Brig. Gen. W. P. Warner; Gastroenterological Problems in the Canadian Navy, Surg. Comdr. J. Wendell MacLeod; Some Principles and Problems in Immunity, Dr. C. E. Dolman; Thiouracil in Graves' Disease, Dr. David P. Barr; Body Section Radiography, Comdr. Wendell G. Scott; Maintenance of Normal Body Temperature in Service Personnel, Group Capt. G. E. Hall; Some Experience with the Use of Gold Salts in the Treatment of Arthritis, Dr. P. H. Sprague; Observations on Active Rheumatic States, Dr. John MacEachern; Malaria Control (with two films), Lieut. Comdr. Frank P. Mathews, September 15.

Rhoads General Hospital, Utica, N. Y., in conjunction with the fifth district branch of the Medical Society of the State of New York: Tuberculosis, Drs. Ethan Flagg Butler and S. Eric Simpson; Chest X-Rays in Industry, Dr. William C. Jensen; Tuberculosis in Military Service, Capt. Daniel J. Feldman; president's address, Dr. Herbert H. Bauckus; Rehabilitation of the War Veteran, Dr. Roy Woodward; motion picture demonstration, "Psychology in Action," September 19.

At Mayo General Hospital, Galesburg, Ill.: Diseases of the Kidneys and Urogenital Tract, Drs. Francis D. Murphy and Wilbur E. Post and Lieut. Col. Harold C. Lueth, September 20.

HOSPITALS NEEDING INTERNS
AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, August 26, page 1197)

CALIFORNIA

Santa Monica Hospital, Santa Monica. Capacity, 220; admissions, 7,970. Mr. Ritz E. Heerman, General Manager (5 interns).

ILLINOIS

Belmont Community Hospital, Chicago. Capacity, 125; admissions, 3,778. Miss Gertrude F. Scofield, Superintendent (interns).
Elgin State Hospital, Elgin. Capacity, 4,946; admissions, 1,495. Dr. Charles F. Read, Managing Officer (residents—psychiatry).
Peoria State Hospital, Peoria. Capacity, 2,708; admission, 765. Dr. Joseph H. Ellingsworth, Medical Superintendent (residents—psychiatry).

NEW YORK

Harlem Eye and Ear Hospital, New York City. Capacity, 50; admissions, 1,719. Dr. Charles B. Meding, Executive Surgeon (resident—ophthalmology-otolaryngology).
Sydenham Hospital, New York City. Capacity, 247; admissions, 4,619. Miss Fanny Fried, Executive Secretary (interns—2 October, 2 November, 2 December).

PENNSYLVANIA

Chester County Hospital, West Chester. Capacity, 178; admissions, 3,442. Mr. Alton F. Reichert, Director (2 interns).

TENNESSEE

Davidson County Tuberculosis Hospital, Nashville. Capacity, 300; admissions, 328. Dr. R. R. Crowe, Superintendent (2 residents—tuberculosis, July 1945 to March 1946).

VIRGINIA

Alexandria Hospital, Alexandria. Capacity, 175; admissions, 4,474. Mr. R. G. Whitton, Superintendent (3 interns).

WARREN F. DRAPER PROMOTED
TO MAJOR GENERAL

Announcement has just been made of the promotion of Brig. Gen. Warren F. Draper to the rank of major general. General Draper, a graduate of Harvard Medical School, Boston, in 1910, began as assistant surgeon, United States Public Health Service, in that year. During the first world war he was assigned to the Army and had charge of extracantonment sanitation in the Norfolk, Va., area. Since then he has served as assistant surgeon general in charge of the states relation division of the Public Health Service, and for three years he served as state health officer of Virginia. In 1939 he was named assistant to the Surgeon General under Dr. Thomas Parran and later became deputy surgeon general. In the spring of this year he was assigned to duty with the Army in the grade of brigadier general at the request of Hon. Henry L. Stimson, Secretary of War. At present General Draper is chief of the public health branch of civil affairs in the European theater. This branch is responsible for the care of ill and injured civilians in the battle area, helps distribute medical supplies and gives advice on prevention and control of disease among civilians and animals. General Draper was a member of the House of Delegates of the American Medical Association from 1925 to 1943 inclusive.

PUBLIC HEALTH UNDER HITLER

For the first time during the war Reich Health Leader Dr. Conti on May 24, according to DNB, addressed a large gathering of men and women medical students of Freiburg University when he spoke on the problem of recruiting for the medical profession. He drew a picture of the aims and tasks which today just after the victorious conclusion of the war face the future members of the medical profession in the spheres of public health, racial and population policy, and the guidance of the people from a purely scientific medical point of view. His statements, in which he drew a parallel between the profession of doctor and the young medical student of the period after the first world war and today, culminated in an appeal to make a substantial and energetic contribution to solving all problems arising in this struggle, which is a necessity of fate.

Referring in particular to future doctors, Conti emphasized that however great the number of new men and women doctors, we shall always need them. The postwar tasks in all the various fields of public health are so numerous that we can never have enough doctors. (Freiburg University has put a ban on admission to a number of other faculties.) After the war the German people will see a new upward development in the numbers of all population too which will put into the shade all previous experience. The basis of nutrition, which is closely connected with that of the health policy of the German nation, is completely safeguarded and all our enemies' hopes for a collapse have come to naught, for the victory in which we believe remains ours.

According to *Völkischer Beobachter* of April 23, 1944 (Germany) as part of the work of the RDF, the Office for Racial Policy, in agreement with the party chancellery, has founded a marriage bureau. It started as a correspondence center of the RDF first of all in Dresden. In view of the excellent results achieved in Saxony, a Rhineland branch of the correspondence center was recently opened in Strasbourg, Danzig, Frankfurt on the Main, Munich, Graz, Vienna, Hanover and Berlin. The Cologne correspondence center is under the direction of the head of the Office of Racial Policy of the Gau Administration Köln-Aachen, Oberbereichsleiter Merzenich.

Nieuwe Rotterdamse Courant of April 14, 1944 (Netherlands) publishes figures for cases of contagious diseases reported during the week March 19-25 inclusive: diphtheria 1,427 (Amsterdam 172, Rotterdam 164), scarlet fever 800 (Amsterdam 176, Rotterdam 73), infantile paralysis 13 (Hennaardera-deel 4).

ORGANIZATION SECTION

WASHINGTON LETTER

(From a Special Correspondent)

Aug. 28, 1944.

Recent Developments in Emergency Medical Service

Through their voluntary organization to meet disasters and emergencies under the Emergency Medical Service of the Office of Civilian Defense, doctors throughout the nation have demonstrated their ability to serve in time of disaster. Their work in the Hartford circus fire is one recent striking example. While the OCD budget has been reduced from some \$4,000,000 last year to \$778,000 for 1944, its voluntary program carries on, and there is indication that its emergency medical program is one form of voluntary organization that will continue after the war.

The OCD medical program has of late been under the direction of a U. S. Public Health Service doctor, Senior Surgeon John J. Bourke. As medical assistant to the director of civilian defense, Lieut. Gen. William N. Haskell, he has been responsible for much of the planning that has prompted recent developments. Most significant of these was the appointment of Public Health Service commissioned officers assigned to the service commands of the Army as liaison officers, to be available, in addition to their regular duties, as medical field representatives of the Office of Civilian Defense. Their new duties will be to assist the states in all Emergency Medical Service problems.

Because of budget limitations of OCD the services of medical officers in the nine civilian defense regions were terminated. As a result, General Haskell requested Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, to make the liaison officers available for OCD duty if needed. Dr. L. H. Thompson, Assistant Surgeon General of the U. S. Public Health Service, has pointed out that the new duties will involve dealings with the medical assistant to the director of OCD, with the state chiefs of Emergency Medical Service, the officers of the service commands in matters pertaining to Emergency Medical Service.

A word about the background of the Emergency Medical Service program of the Office of Civilian Defense: For several years, volunteer organizations had been developed in fire and police services. Since EMS has more recently been developed, it has provided competent medical relationship in the community,

assisted by an advisory committee representing the various responsible agencies such as the medical profession, hospital groups, nursing organizations and the Red Cross. It has provided a "relatively safe" type of field operation which allows for the use of specially trained volunteers in the field of first aid and rescue.

What is said to be even more important from the standpoint of prospective patients in a disaster is a coordinated central control which tends to prevent the overloading of any one institution beyond its capacity as to bed space and professional or specialized service. The internal organization and planning which have taken place within the hospitals as part of the Civilian Defense program have tended to develop competent medical teams under physician and nurse supervision to report promptly to the scene of the accident, while other professional groups within the hospital are assigned specific duties following the reception of patients which will allow them to exercise special skills in surgery, shock, resuscitation, burn therapy and fracture work to the ultimate advantage of the patient's recovery. The work of the local chief of Emergency Medical Service and his advisory committee has provided a careful, unbiased appraisal of the medical facilities.

The nine Public Health Service commissioned officers now with the army service commands as liaison officers, who will also act as field representatives of OCD, are:

Sr. Surgeon O. F. Hedley, Liaison Officer, U. S. P. H. S., First Service Command, 808 Commonwealth Avenue, Boston.

Sr. Surgeon Albert W. Russell, Liaison Officer, U. S. P. H. S., Second Service Command Headquarters, Governors Island, N. Y.

Sr. Surgeon Fred W. Kratz, Liaison Officer, U. S. P. H. S., Third Service Command Headquarters, U. S. Post Office and Courthouse, Baltimore.

Medical Director Joseph Bolten, Liaison Officer, U. S. P. H. S., Fourth Service Command, Post Office Building, Atlanta, Ga.

Surgeon Charles F. Blankenship, Liaison Officer, U. S. P. H. S., Fifth Service Command, Fort Hayes, Columbus 18, Ohio.

Sr. Surgeon Adolph S. Rumreich, Liaison Officer, U. S. P. H. S., Sixth Service Command, 2129 Civic Opera Building, 20 North Wacker Drive, Chicago 6.

Medical Director L. O. Weldon, Liaison Officer, U. S. P. H. S., Seventh Service Command, Federal Building, Omaha.

Medical Director K. E. Miller, Liaison Officer, U. S. P. H. S., Eighth Service Command, Fort Sam Houston, San Antonio, Texas.

Medical Director W. T. Harrison, Director Ninth U. S. P. H. S., Service District, 1223 Flood Building, San Francisco.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—A subcommittee of the House Committee on Labor has initiated hearings to investigate the aid given to the physically handicapped, pursuant to H. Res. 230 adopted by the House of Representatives in June 1944. Representative Kelley of Pennsylvania is chairman of the subcommittee. The other members are Representatives Randolph, West Virginia, Worley, Texas, Scanlon, Pennsylvania, Welch, California, Day, Illinois, and Baldwin, New York. The initial hearing was scheduled for the period extending from August 29 to August 31, at which time testimony was received with respect to the blind. A subcommittee of the House Committee on Civil Service has been conducting hearings on H. R. 4909, a bill to provide health programs for government employees. Among the witnesses who testified at the hearings were War Manpower Commissioner Paul V. McNutt, Civil Service Commissioner Arthur S. Fleming, Brigadier General Hines, Veterans Administrator, Surgeon General Parran, United States Public Health Service, Dr. Victor G. Heiser, Medical Consultant of the National Association of Manufacturers, and Dr. Carl Peterson, Secretary of the Council on Industrial Health of the American Medical Association. H. R. 5125 has passed the Senate, with numerous amendments, proposing to establish a Surplus War Property Administration and to provide for the proper disposal of surplus war property. One section assigns to veterans, including physicians and dentists, suitable preferences to the extent feasible in

acquisition of types of surplus property useful in carrying on the business or professional activity of the veteran. In the discussion of this section on the floor of the Senate, reference was made to the fact that many physicians and dentists sold their "businesses to go into the armed forces when they were called."

Bills Introduced.—H. R. 5171, introduced by Representative Dingell, Michigan, provides that, under the rules and regulations prescribed by the Secretary of War, the Surgeon General of the Army will be authorized and directed to appoint as second lieutenants in the Medical Department of the Army enlisted men who have served three years or more in such department. H. R. 5172, introduced by Representative Dingell, Michigan, provides that under rules and regulations prescribed by the Secretary of the Navy the Surgeon General of the Navy will be authorized and directed to appoint as ensigns in the Medical Department of the Navy enlisted men who have served three years or more in the Hospital Corps. H. R. 5173, introduced by Representative Harless of Arizona, provides that any enlisted man in the Medical Department of the Army who is serving or shall have served in a combat area during the present war shall be paid additional compensation at the rate of \$10 per month for the period beginning as of the date of the commencement of such service or as of Jan. 1, 1944, whichever date is the later, and ending six months after the date of the cessation of hostilities as proclaimed by the President.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Dr. McLester Named Chairman of Hospital Board.—Dr. James S. McLester, Birmingham, has been named chairman of a five member administrative board of hospitals which is to meet twice a month to administer operation of Jefferson and Hillman hospitals within the pattern of the University of Alabama School of Medicine, Birmingham. The position of chairman will be occupied by a member for one year, rotating among other members, according to vote of the board in a recent meeting with members of the Jefferson County Commission and Raymond R. Paty, LL.D., president of the university. Dr. McLester will serve as chairman until Dec. 31, 1945. Other members of the board are Judge Gardner F. Goodwyn Jr., Bessemer, vice chairman, E. A. Lowe, secretary, and Dr. Harry I. Jackson, Thomas W. Martin and Edward Norton, all of Birmingham.

CONNECTICUT

Clinical Congress.—The twentieth clinical congress of the Connecticut State Medical Society will be held at the New Haven Lawn Club, New Haven, September 28-29. Among the speakers will be:

- Dr. William B. Terhune, New Canaan, Psychiatric Problems of the Returning Soldier.
- Dr. John R. Paul, New Haven, Infectious Hepatitis.
- Dr. Harry Gold, New York, How to Choose the Correct Digitalis Preparation.
- Dr. Joseph E. F. Riseman, Boston, The Modern Treatment of Angina Pectoris.
- Lieut. Col. Herrman L. Blumgart, M. C., The Relation of Effort to Myocardial Infarction.
- Dr. Robert H. Williams, Boston, Thiouracil in the Treatment of Hyperthyroidism.
- Dr. Robert M. Yergason, Hartford, Metallic Fixation of Fractures by the Use of Recently Devised Methods and Appliances: Special Reference to Kirschner Wire, Vitallium Screws, Tantalum Foil and Plates.
- Dr. Herman E. Pearse Jr., Rochester, N. Y., Recent Advances in Common Duct Surgery.
- Dr. Arthur J. Geiger, New Haven, Bacterial Endocarditis.
- Dr. Joseph Kreiselman, Washington, D. C., Resuscitation.
- Dr. Kenneth W. Thompson, New Haven, Present Trends in the Treatment of Varicose Veins.
- Dr. Julian B. Herrmann, New York, Recent Advances in the Treatment of Cancer of the Breast.
- Dr. John J. Morton Jr., Rochester, Progress in Cancer Research.

One afternoon session will be devoted to a symposium on penicillin medicine and surgery by Dr. Francis G. Blake, dean and professor of medicine, Yale University School of Medicine, and his staff and Dr. Samuel C. Harvey, professor of surgery at Yale, and his staff. A second afternoon session will be devoted to demonstrations in the treatment of burns at the New Haven Hospital and the care of extremities with deficient arterial circulation.

FLORIDA

Personal.—Dr. Robert G. Nelson, Tampa, has been appointed a member of the state board of medical examiners to succeed Dr. William M. Rowlett, Tampa, resigned.

Food Handlers Educational Program.—Arrangements are being made by the Jacksonville Health Department, in cooperation with the state and county department of vocational education, to start a perpetual food handlers educational program the early part of September. The program will be a twelve hour course, comprising six meetings each two hours in length and is designed to meet the practical needs of food handlers.

ILLINOIS

Chicago

Anton Carlson Honored.—The July issue of *Gastroenterology*, the official journal of the American Gastroenterological Association, was dedicated to Dr. Anton J. Carlson, recipient of the association's Friedenwald Medal for 1944 and emeritus professor of physiology, University of Chicago School of Medicine, since 1940. In addition to carrying scientific material, the journal includes editorial tributes to Dr. Carlson.

University News.—Major General George F. Lull, deputy surgeon general, U. S. Army, will be the principal speaker

at the graduation exercises for the class of 1944 at Northwestern University Medical School in Thorne Hall, September 14, at 4 o'clock. Admission will be by invitation only. After the exercises the medical division of the alumni association will hold a reception in Thorne Hall for the graduating class, faculty members and their families.

Institute for Hospital Administrators.—The Chicago Institute for Hospital Administrators will be held at International House, University of Chicago, September 11-22. This year for the first time the institute will be conducted by the American College of Hospital Administrators instead of by the American Hospital Association. Dr. Malcolm T. MacEachern will be director of the institute, a position he has held since it was started twelve years ago. Additional information may be obtained from the American College of Hospital Administrators, 18 East Division Street.

Fernel Named in Violation of Drug Act.—Dr. Jean Paul Fernel was named August 21 in a criminal information filed before Federal Judge Michael L. Igoe that charged twenty-three counts of violating the Federal Food, Drug and Cosmetic Act. The action alleged that Dr. Fernel had engaged in a mail order business "purveying medical preparations that the government charges are misbranded," according to newspaper reports. It is further stated that Dr. Fernel was found guilty last November of similar charges (*THE JOURNAL*, Nov. 27, 1943, p. 849), was sentenced to one year in the county jail and was fined \$500. He is said to be now out on bail pending an appeal to the U. S. Circuit Court of Appeals.

KENTUCKY

Tuberculosis Commission Appointed.—Governor Simeon S. Willis on July 31 named a commission of eleven men and one woman to inaugurate Kentucky's first statewide program of tuberculosis treatment and control. Primary task of the commission will be to select sites for five tuberculosis sanatoriums authorized by the 1944 legislature. Initial phases of the program will be financed by \$1,500,000 which the legislature ordered taken from the state treasury's surplus and invested in war bonds until contracts can be let for construction work. Three members of the commission are Drs. Gaiethel L. Simpson, Greenville; Omer F. Hume, Richmond, and Carl C. Howard, Glasgow. Eight members were named from the public at large. Dr. Philip E. Blackerby, Louisville, commissioner of health of Kentucky, was named to a four year term by virtue of his office. Members draw no pay or personal expenses. The 1944 act divided the state into six districts and specified that a sanatorium must be located in each of them, excepting only the Louisville district, which is already served by the State Tuberculosis Sanatorium (Hazelwood), Louisville. The five remaining districts are drawn to serve the west, north, northeastern, southeastern and south central sections of the state. The commission has the authority to acquire land and should select sites best suited for the purpose. It must report to the governor after ninety days of appointment, but the time can be extended if necessary.

MARYLAND

Institute of Alcoholism.—The National Committee on Alcohol Hygiene, in conjunction with a Baltimore sponsoring committee, will hold an institute on alcoholism in Baltimore, September 14. Three group sessions will be devoted to "The Effects of Alcohol on the Individual" by Dr. Robert V. Seliger, Baltimore; "New Approaches to Understanding the Alcoholic" by Victoria Granford, psychotherapist, Catonsville, Wilson Shaffer, Ph.D., Baltimore, and Dr. Lawrence F. Woolley, Towson, and "Alcoholism and Crime" by Robert M. Lindner, Ph.D., U. S. Public Health Service. At an evening session the speakers will be Dr. Seliger on "Alcoholics Are Sick People"; Lawrence Kolb, assistant surgeon general, U. S. Public Health Service, "Alcoholism as Viewed by the U. S. Public Health Service," and Dr. Haven Emerson, New York, "Alcoholism and Public Health."

MICHIGAN

Course on Postwar Diseases.—The University of Michigan School of Public Health, Ann Arbor, will conduct a course on postwar diseases for public health workers in the Middle West, September 20-22. On the first day virus diseases, particularly influenza and poliomyelitis, will be discussed by Dr. Thomas Francis Jr., University of Michigan Medical School, Ann Arbor, and director of the commission on influenza, U. S. Army; Dr. Don W. Gudakunst, New York, medical director of the National Foundation for Infantile

Paralysis; Major Albert B. Sabin, M. C.; Dr. John R. Paul, Yale University School of Medicine, New Haven, Conn., and Dr. Franklin H. Top, medical director of Herman Kiefer Hospital, Detroit. Exotic and tropical diseases will be discussed during the next two days by Brig. Gen. Leon A. Fox, field director of the U. S. Typhus Commission. Malaria will be discussed by Comdr. Lowell T. Coggeshall (MC) and Major Stanley B. Freeborn, M. C., and dysentery by Albert V. Hardy, surgeon, U. S. Public Health Service, and Dr. George D. Cummings, Lansing. Other speakers will include Dr. Joseph G. Molner, deputy health commissioner of Detroit, who recently returned from Mexico and Central America, on tropical diseases and Dr. Haven Emerson, New York, chairman of the committee on communicable diseases of the American Public Health Association, who will give a preliminary report on the activities of this group.

Fluorine Program in Michigan.—Grand Rapids has been chosen for a carefully controlled experiment in dental caries under the auspices of the Michigan Department of Health, U. S. Public Health Service and the University of Michigan School of Dentistry. The experiment will include the addition of 1 part per million of sodium fluoride to a municipal water supply artificially to determine whether a reduction can be made in dental caries. A careful clinical and bacterial examination of the saliva of Grand Rapids school children will first be made to establish a base line before the fluorine is put in the water. According to Dr. William DeKleine, state health commissioner, it is now generally accepted that the number of *Lactobacillus acidophilus* organisms found in the saliva is also an accurate diagnostic index of the activity of dental caries in that mouth. Areas having fluorine naturally in the municipal water have a much lower bacterial count. This study stems from the belief that mottled enamel occurring in certain areas of the country is caused by fluorine in the drinking water and causes the mottling only when the crowns of teeth are forming. Investigation showed much less dental caries in these areas than where there is no fluorine or only a trace in the drinking water. Further studies showed that in areas having from 0.5 to 1 part per million of fluorine in the municipal water supply there was a 50 to 60 per cent reduction in dental caries and yet this amount was not sufficient to cause disfiguring enamel. Studies have been carried out in various sections of the country. The plan to add the fluorine to the Grand Rapids water supply was approved by the city commission on July 31. The city was selected because it has a stable population, an item to be considered in an experiment to be continued over a number of years.

MONTANA

State Medical Election and Meeting.—Dr. Sidney A. Cooney, Helena, was named president-elect of the Medical Association of Montana at its annual meeting, July 14, in Butte, and Dr. James C. Shields, Butte, was inducted into the presidency. Dr. Raymond F. Peterson, Butte, is secretary. The following speakers were included on the program:

Dr. Harry L. Baum, Denver, Foreign Bodies in Air and Food Passages.
Dr. John K. Colman, Butte, Pyogenic Bone Infections.
Dr. Henry E. Michelson, Minneapolis, Common Diseases of the Skin.
Dr. John M. Waugh, Rochester, Minn., Traumatic Injuries of the Abdomen.
Dr. Orville M. Moore Jr., Helena, Exanthema Subitum and Erythema Infectiosum.
Dr. Elma M. Howard, Miles City, Erythroblastosis.
Dr. Coran L. Bourdeau, Missoula, Surgical Indication in Gastric Lesions.
Dr. Chester W. Lawson, Glasgow, Experiences in China.
Dr. Earl L. Hall, Great Falls (subject not announced).

NEBRASKA

Dean Poynter Honored.—On July 15 the faculty and alumni of the University of Nebraska College of Medicine, Omaha, gave a dinner in honor of Dr. Charles William M. Poynter, dean of the medical school, in recognition of his seventieth birthday. Col. Edgar V. Allen, M. C., medical consultant of the Seventh Service Command, a graduate of the Nebraska medical school in 1925, was the toastmaster.

NEVADA

Mines Hospital Closed.—On August 15 the Tonopah Mines Hospital, Tonopah, was closed and the buildings and equipment merged into the Nye County Hospital. The action was taken after the closing of all gold and silver mines as nonessential war industries and the resignation of Dr. Robert R. Craig, medical director of the hospital for more than twenty-five years. Dr. Joseph H. Coogan, recently appointed county physician and health officer, will be in charge of the newly reorganized Nye County Hospital.

NEW JERSEY

Narcotic Violation.—Dr. Joseph L. Polizzotti, Paterson, pleaded guilty in the U. S. District Court at Trenton July 14 to a violation of the federal narcotic laws and paid a fine of \$500.

Illegal Practitioner's Fine Increased.—On August 11 the state supreme court ordered the first district court of Jersey City to amend a judgment fining George H. Coleman \$200 on a charge of practicing medicine without a license in Kearny by increasing the fine to \$500. The supreme court's action resulted from an appeal by the state board of medical examiners, which filed the original charge against Coleman and contended that the higher fine should have been imposed because the offense was his second, according to the *New York Times*.

NEW MEXICO

Personal.—Judson D. Dowling, senior surgeon of the United States Public Health Service Reserve, has been assigned to the New Mexico Department of Public Health as assistant state director of health.

New Mexico Joins Rocky Mountain Medical Journal.—Arrangements have been completed by which the *Rocky Mountain Medical Journal* will be the official journal of the New Mexico Medical Society. Dr. Carl H. Gellenthien, Valmora, is to be the editor for New Mexico.

State Medical Election.—Dr. Charles A. Miller, Las Cruces, was named president-elect and Dr. Carl H. Gellenthien, Valmora, was installed as president of the New Mexico Medical Society at its annual meeting recently. Dr. Leo B. Cohenour, Albuquerque, is secretary. The next annual meeting will be held in Santa Fe some time in June 1945.

NEW YORK

Poliomyelitis Delays Opening of Schools.—Opening of Hornell public schools, originally scheduled for September 5, has been postponed until October because of the infantile paralysis epidemic, the *Rochester Times-Union* reported August 22. At the time of the report Rochester had 39 patients under treatment, 21 of whom were city residents.

Special Lectures.—Dr. Orren D. Chapman, professor of bacteriology and parasitology, Syracuse University College of Medicine, Syracuse, addressed the St. Lawrence County Medical Society, August 17, in Gouverneur on "Tropical Diseases." Dr. Paul C. Clark, assistant professor of clinical medicine at Syracuse, addressed the Madison County Medical Society at Sylvan Beach, August 10, on "Penicillin Therapy." Both lectures were part of a cooperative project between the state medical society and the state department of health.

New York City

Dr. Lasersohn Named Assistant to President at Winthrop.—Dr. Martin Lasersohn, medical director of the Winthrop Chemical Company, has been appointed assistant to the president and assistant treasurer of the company. He has also been elected secretary of Fairchild Brothers and Foster, a Winthrop subsidiary. Dr. Lasersohn has been associated with the company since 1930.

Sentenced as Abortionist.—Dr. Stephen A. Leslie was sentenced July 18 in General Sessions to a one year term in the penitentiary as an abortionist, the *New York Times* reported. It was stated that Judge George L. Donnellan had denounced him as a refugee who had abused the privileges extended to him in America by operating an abortion mill at 993 Park Avenue for several years.

Ivan Hall Named Professor of Bacteriology.—Ivan C. Hall, Ph.D., since 1942 director of the central laboratory, contaminated wound project, subcommittee of surgical infections, National Research Council, formerly professor and head of the department of bacteriology and public health in the University of Colorado School of Medicine, Denver, has been appointed professor and chairman of the department of bacteriology at the New York Medical College, Flower and Fifth Avenue Hospitals. He will succeed Laura Florence, Ph.D., who will retire in September.

Personal.—Thomas P. Fleming, M.S., librarian of the Columbia University College of Physicians and Surgeons, has been appointed assistant director of the libraries of the university.—Dr. George T. Pack was recently decorated by the president of Chile with the title of Grand Officer of the Order of Merit.—Frank S. Lloyd, Washington, D. C., executive officer of the Committee on Physical Fitness of the Federal Security Agency, has been appointed chairman of the depart-

ment of hygiene of the College of the City of New York, succeeding Frederic A. Woll, Ph.D., who retired on account of age on August 31.

NORTH DAKOTA

New Director of Maternal and Child Hygiene.—Dr. Frederick G. Gunlaugson, Fergus Falls, Minn., has been appointed director of maternal and child hygiene of the North Dakota State Department of Public Health, succeeding Dr. Mary E. Soules, Dickinson, who resigned. Dr. Gunlaugson graduated at the University of Minnesota Medical School, Minneapolis, in 1935 and received his master of public health degree from Johns Hopkins.

Free Plasma for the Public.—The state legislature recently appropriated a fund to set up and finance a free plasma service under the direction of the director of the division of laboratories of the state department of public health in cooperation with the University of North Dakota, Grand Forks. Donor clinics are to be set up throughout the state with a mobile unit from the health department conducting clinics in each community. All donors are given a blood donor certificate indicating that its possessor has rendered a public service in the state by giving blood. Complete coverage of the state with normal supplies is the first objective of the program. Each package sent out into the state will contain one bottle of dried pooled normal human plasma, one bottle of 0.1 per cent citric acid solution for restoration of the plasma, a complete set of equipment for administering plasma, and directions for its use. The service is available free of charge to every one in the state.

OHIO

New Chairman of Anatomy.—Ralph A. Knouff, Ph.D., professor of anatomy at the Ohio State University College of Medicine, Columbus, since 1932, has been appointed chairman of the department.

License Suspended.—The license to practice medicine in Ohio of Dr. Ward C. Bell, formerly of Cleveland, has been suspended indefinitely. Dr. Bell was convicted of criminal abortion and served an indeterminate sentence in the Ohio Penitentiary, it is reported.

Physicians Honored.—The Portage County Medical Society gave a dinner recently in honor of two of its members, Drs. Lucius W. Prichard, Ravenna, and Joseph H. Krape, Kent. Dr. Prichard has completed fifty-four years of practice in Ravenna and Dr. Krape fifty years at Kent. Dr. Bernard H. Nichols, Ravenna, was toastmaster at the dinner.

Memorial for World War Physicians.—The Toledo Academy of Medicine has recommended the construction of a memorial building as a testimonial to the physicians of Toledo who served with the armed forces of the United States in World Wars I and II. The *Journal of the Michigan State Medical Society* reports that an assessment of \$300 per member for a new memorial building or \$150 per member for remodeling the present home of the academy of medicine is being presented to the membership for decision.

SOUTH DAKOTA

Sioux Falls Health Officer Goes to California.—Dr. Francis H. Redewill Jr. has resigned as director of the Sioux Falls health department to accept a position as venereal disease control officer of the Los Angeles County Health Department. He will be succeeded by Dr. Emil G. Ericksen, who once was health officer of Sioux Falls and who for the last year has been assistant to Dr. Redewill, according to the *Journal-Lancet*.

TENNESSEE

The Haggard Lecture.—Dr. Alfred Blalock, professor of surgery, Johns Hopkins University School of Medicine, Baltimore, and formerly professor of surgery at Vanderbilt University School of Medicine, Nashville, recently delivered the annual Haggard Memorial Lecture at Vanderbilt on "Recent Advances in Surgery."

Walter Garrey Made Professor Emeritus.—Dr. Walter E. Garrey, professor and head of the department of physiology, Vanderbilt University School of Medicine, Nashville, retired June 30 with the title professor emeritus. According to an announcement from Dr. Waller S. Leathers, dean of the medical school, July 31, Dr. Garrey's successor had not yet been selected.

Personal.—Marion Murphy Brooke, Sc.D., associate in parasitology at the School of Hygiene and Public Health of the Johns Hopkins University, Baltimore, has been appointed

associate professor of preventive medicine at the University of Tennessee College of Medicine, Memphis.—Dr. James K. P. Blackburn, Pulaski, has been named a member of the state basic science board, succeeding Dr. Waller S. Leathers, Nashville, who resigned recently.

WEST VIRGINIA

State Meeting in Clarksburg.—The seventy-eighth annual meeting of the West Virginia State Medical Association will be held at Clarksburg, May 14-15, 1945. The Waldo, Stone-wall Jackson and Gore have been designated the convention hotels. Technical and scientific sessions will be held at the Waldo Hotel.

Educational Consultant in Cancer Control.—Mrs. Marian Patrick Hart, assistant chief of the division of social service in the state department of public assistance, Charleston, has been appointed educational consultant in the state division of cancer control, effective September 1. The appointment is a part of the expanded program of cancer control financed by the state legislature and recently inaugurated with the appointment of Dr. Paul R. Gerhardt as director (*THE JOURNAL*, March 4, p. 660).

Poliomyelitis Quarantine Modified.—To permit poliomyelitis patients to receive early treatment in hospitals suitably equipped, Dr. John E. Offner, Weston, state health commissioner, has modified the regulation requiring three weeks' quarantine to permit the immediate transfer of patients from their homes to a hospital. The order will continue in force until November 1. Written permission must be obtained from the local health officer or state health department before a patient may be moved from one county to another. Thirty-eight cases of poliomyelitis were reported to the state department of health from July 1 to August 16.

WYOMING

George Baker Named Acting Secretary of State Society.—Dr. George E. Baker, Casper, has been appointed acting secretary of the Wyoming State Medical Society during the illness of Dr. Marshall C. Keith, secretary. Dr. Keith was taken ill July 1 and will not be able to resume his activities for a while.

GENERAL

College of Surgeons Cancels Meeting.—The American College of Surgeons, on action of its board of regents, has canceled its annual clinical congress because of the acute war situation that has developed, involving greater demands than at any time in the past on our transportation systems for the carrying of wounded military personnel, troops and war material. The congress was to have been held in Chicago, October 24-27.

Meeting of Obstetricians, Gynecologists and Abdominal Surgeons.—The fifty-sixth annual session of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons will be held at the Homestead, Hot Springs, Va., under the presidency of Dr. Willard R. Cooke, Galveston, Texas (*THE JOURNAL*, August 12, p. 1051). Features of the meeting will include a series of motion pictures and a banquet address by Hon. Dave E. Satterfield Jr., member of Congress from Virginia. There will be a golf tournament on Saturday, September 9, at which the play will be for the President's Trophy, given in 1938 by Dr. Paul Titus, Pittsburgh, then president of the association. Dr. James R. Bloss, 418 Eleventh Street, Huntington, W. Va., is the secretary of the association.

Wisconsin Foundation Wins Court Reversal.—A United Press dispatch from San Francisco August 24 stated that the U. S. Circuit Court of Appeals the previous day had withdrawn an opinion handed down June 30, 1943 invalidating patents of the Wisconsin Alumni Research Foundation involving the treatment of rickets with vitamins. The court held at the time that vitamins, being derived from the sun, could not be patented, according to the *Chicago Daily News*. In contradiction of this opinion the foundation in August 1943 asked for a rehearing of the case, which charged a Los Angeles company with infringement of the patents, it was stated. No explanation was given for the withdrawal, which was said to be almost unprecedented in court procedure, the *News* reported.

Special Society Elections.—Dr. William H. Daniel, Los Angeles, was elected president of the American Proctologic Society at its annual meeting in Chicago. Dr. Joseph W. Ricketts, Indianapolis, vice president, and Dr. Harry E. Bacon, Philadelphia, secretary. The next annual meeting of the society will be held in New York preceding the annual

session of the American Medical Association.—Dr. Claude S. Beck, Cleveland, was chosen president of the American Association for Thoracic Surgery at its annual meeting in Chicago recently. Dr. Isaac A. Bigger, Richmond, Va., is vice president and Lieut. Col. Richard H. Meade Jr., M. C., Memphis, Tenn., secretary.—Dr. S. Judd Beach, Portland, Maine, was chosen president of the American Ophthalmological Society at its annual meeting in Hot Springs, Va., recently. Dr. Walter S. Atkinson, Watertown, N. Y., is secretary. The next annual meeting will be held in Hot Springs, Va., June 6-8, 1945.

New Group for Rheumatic Fever.—The Council on Rheumatic Fever has been formed to focus attention on the problem of rheumatic fever. Organizations comprising membership in the new council include the American Medical Association, American College of Physicians, American Rheumatism Association, American Academy of Pediatrics, American Public Health Association, American Hospital Association, American Association of Medical Social Workers, American Nurses Association and the American Heart Association. The establishment of the new group stemmed from action taken at a conference on rheumatic fever in New York, January 26-27, at which representatives from the various military services and nationally interested groups agreed that a concentrated program on rheumatic fever should be instituted. The American Heart Association, under whose authority the creation of the new group was placed, announces that a suggestion has been made to incorporate the council as an independent organization under the laws of New York state. It is hoped that a fund of \$50,000 will be obtained within the near future to justify the selection of a director, the rental of offices and the employment of an office staff. Currently about \$7,000 is available, while another \$5,000 is expected soon. Negotiations are in progress with officers of the American Legion in the hope that the Legion may accept the responsibility for the financial support of the council on a national scale.

Joint Meeting of Radiologists.—A joint meeting of the American Roentgen Ray Society and the Radiological Society of North America will be held at the Palmer House, Chicago, September 24-29, under the presidency of Drs. Sherwood Moore, St. Louis, and Eldwin R. Witwer, Detroit, respectively. Among the speakers will be:

Drs. Herman L. Kretschmer, President, American Medical Association, and Fay H. Squire, Chicago, A Study of the Ureters in Bladder Neck Obstructions.

Col. Byrl R. Kirklin, M. C., representing Surgeon General Norman T. Kirk of the Army (subject not announced).

Lieut. Comdr. Robert K. Arbuckle (MC), representing Surgeon General Ross T. McIntire of the Navy, Lieut. C. Hunter Shelden (MC) and Lieut. Robert H. Pudenz (MC), Pantopaque Myelography: Correlation of Roentgenological and Neurosurgical Findings.

Drs. Joseph George Teplick and Alison H. Price, Philadelphia, Progressive Bilateral Hemiparesis.

Dr. John A. Turek, M. C., Robert O. Turek, M. C., Plainfield, N. J., and the Diagnosis of Cancer.

Dr. Robert A. Turek, M. C., Aspect of Tuberculous Calcification.

Dr. Arbo, D., and the Study of the Effect of X-ray Irradiation in Carcinoma of the Prostate.

Major Milton Friedman, M. C., and Lieut. Col. Lloyd G. Lewis, M. C., An Improved Technique for the Treatment of Carcinoma of the Testis.

Dr. Russell L. Haden, Cleveland, Hematological and Clinical Characteristics of Leukemias.

Drs. Ross Golden and Paul H. Ducharme, New York, X-Ray Demonstration of Cecal Deformity in Amebiasis.

Drs. Percival Bailey and Theodore J. Wachowski, Chicago, Roentgen Therapy for Brain Tumors.

Dr. William Gayle Crutchfield, University, Va., Neurosurgical Treatment of Patients with Advanced Malignant Disease.

Dr. Dallas B. Phemister, Chicago, Subcortical Cystlike Lesions of Joints.

Drs. Laurence L. Robbins and Clayton H. Hale, Boston, Roentgen Appearances in Collapse of the Lung and Its Subdivisions: Preliminary Report.

Drs. Howard B. Hunt and Donald H. Breit, Omaha, Postirradiation Cutaneous Necrosis: A Study of Its Mechanism, Course and Treatment.

Lieut. Henry L. Jaffe (MC), Evaluation of Roentgen Therapy for Filariasis.

Dr. Lawrence Reynolds, Detroit, will deliver the Caldwell-Carman Lecture on Tuesday.

Medical Section of A. A. A. S. Meeting.—Section N, the medical section of the American Association for the Advancement of Science, will hold a joint meeting September 12 with the American Society of Parasitologists and the American Society of Zoologists. The session will be held in the Academy of Medicine of Cleveland and will be devoted to a symposium on "Parasitology in Relation to the War." Another joint session of the section with the section on engineering (M) will be a symposium on "Aviation Medicine." On Thursday a joint session will be held with Alpha Epsilon Delta, national honorary premedical fraternity, on "Premedi-

cal Education." Among the speakers in the symposium on "Parasitology in Relation to the War" will be:

Brig. Gen. James S. Simmons, M. C., The Wartime Importance of Tropical Diseases.

Major Oliver R. McCoy, M. C., Malaria and the War.

Clay G. Huff, Sc.D., and Frederick Coulston, Ph.D., University of Chicago, The Development of Malarial Sporozoites in the Vertebrate Host.

Dr. Harold W. Brown, Columbia University College of Physicians and Surgeons, New York, Filariasis.

Dr. Rolla E. Dyer, National Institute of Health, Bethesda, Md., Typhus Fever.

Walter E. Dove, Sc.D., U. S. Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington, D. C., Development of Louse Powders for the Armed Forces.

Benjamin Schwartz, Ph.D., U. S. Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C., Parasites in Relation to Production of Meat and Other Animal Products in Wartime.

On Friday September 15 a symposium on science and the press, sponsored by the National Association of Science Writers, will be presented at the Hotel Statler by Louis B. Seltzer, editor of the *Cleveland Press*; Martin J. Porter, New York, editor of the *American Weekly*; George E. Pendray, Pittsburgh, assistant to the president of Westinghouse Electric & Manufacturing Company, and Dr. Morris Fishbein, Editor of THE JOURNAL. Robert D. Potter, science editor of the *American Weekly* and president of the National Association of Science Writers, will preside and Dr. Anton J. Carlson, Chicago, president of the American Association for the Advancement of Science, will give the introductory remarks. These meetings will be held during the session of the A. A. S. in Cleveland, September 11-16.

CANADA

Personal.—Dr. Lorimer J. Austin, professor of surgery, Queen's University Faculty of Medicine, Kingston, Ontario, recently was presented with the Montreal medal "for meritorious contribution to the honour of Queen's." The medal is awarded occasionally by the Montreal alumni of the university.

Course in Tropical Medicine.—McGill University Faculty of Medicine, Montreal, Quebec, is offering for the first time a diploma course in tropical medicine. The course is also suggested as a refresher course for medical graduates who have been working in the tropics and who wish to take advanced work in parasitology and other branches of tropical medicine. The course is divided into three units: tropical medicine and parasitology, care of ambulatory patients and one in which facilities have been arranged for clinical experience in the tropics. Thomas W. M. Cameron, D.Sc., professor of parasitology at McGill, is in charge of the course.

LATIN AMERICA

Health Activities in Latin America.—Medical Center.—The Anglo-American Caribbean Medical Center was opened in July, Port-of-Spain, Trinidad. The establishment of the center is an initial step in the program fostered by the Anglo-American Caribbean Commission to raise health standards in the West Indies.

Committee to Control Sandfly.—Dr. Henry C. Dooling, chief health officer of the Panama Canal Health Department, has appointed a committee to devise a program for the relief and protection of residents from the sandfly (*Phlebotomus*). The sandfly is the carrier of numerous diseases, but in Panama it is known to transmit only the American cutaneous leishmaniasis. The committee is composed of a health officer, a sanitary engineer, a physician, an epidemiologist and an entomologist.

Personal.—Clarence H. Waring, medical director, U. S. Public Health Service, has recently succeeded Dr. Henry A. Holle as chief quarantine officer of the Panama Canal Health Department. Dr. Holle has left Panama for a new assignment in New York.—Dr. Fernando D. Gómez, Montevideo, was recently appointed rector of the Instituto de Fisiología of the Faculty of Medicine of Montevideo, succeeding Dr. Juan B. Morelli, who recently retired.—Dr. Juan A. Sánchez was recently appointed honorary member of the Asociación Médica Argentina.—Announcement is made of the first anniversary of the death of Dr. Nicolas A. Solano, which was commemorated in special services at Herrera Cemetery, Panama City, July 23. The observance was conducted by the National Liberal Party, of which the late physician was said to have been national chairman at one time.

CORRECTION

Spontaneous Rupture of Aorta.—In the article by Dr. Douglas Symmers entitled "Spontaneous Rupture of the Aorta in Syphilitic Aortitis with Aneurysm," in the August 12 issue, page 1035, the word "with" in the title should read "without."

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 29, 1944.

The Radical Reform of Medical Education

In October 1941 the minister of health announced the intention of the government to inquire into the organization of medical schools, particularly with regard to facilities for clinical teaching. A small committee consisting mainly of leading teachers was appointed. It examined witnesses representing all the medical schools and others interested in medical education, including such Americans in this country as Professor Cutler and Col. William S. Middleton. The result is an elaborate report of 300 pages, in which every aspect of the subject is discussed.

Properly planned and carefully conducted medical education is held to be the essential foundation of a comprehensive health service. The national policy should be to secure for every one the highest possible standard of physical and mental health, the report says. Physicians must bear much of the responsibility for attaining this goal, and graduate and postgraduate training must impart the necessary knowledge to physicians. The present system of medical education is held to be seriously deficient in this respect. To the neglect of the promotion of health, medical practice—and consequently medical education—has been concerned primarily with disease chiefly as it affects individuals. A radical reorientation of medical education and practice is essential, the committee believes. One of the basic proposals is that throughout undergraduate and postgraduate education emphasis must be placed on acquisition of a sound knowledge of all measures that may make and preserve a healthy nation.

Although the nation is justified in taking pride in the reputation of British medical practice and traditional methods of education, there is urgent need for improvements, it is held. The training of the undergraduate should provide a university education on broad and liberal lines. The essential unity of medicine should be observed throughout, and the teaching should be so organized that the whole course becomes a smooth and logical development. While primarily practical, the training should give a clear understanding of the constantly developing scientific basis of medicine. The main emphasis should be on fundamental principles rather than on the mass of purely factual knowledge, the committee states.

The unit of organization for undergraduate education should be a medical teaching center consisting of a university medical school and a group of teaching hospitals and clinics of the district health service. A new pattern of staffing is believed to be necessary; more whole time appointments and salaries for clinical teachers in consideration of well defined duties are proposed. A medical school admitting the optimum number, 100 students a year, should have access to between 950 and 1,000 beds, roughly distributed as general medical 250, general surgical 250, maternity 100, gynecologic 50, children 100, and special departments and beds for special purposes 200 to 250. Major teaching hospitals should be linked by means of their staffs with outlying hospitals, and medical schools, as partners in the national health service, should have a place in the administration of the service. Preclinical scientific subjects should be taught by full time professors and there should be more junior staff members, it is suggested. In the clinical field there should be more full time appointments in all grades. At the earliest possible date every medical school should have a whole time professor in medicine, surgery and obstetrics and gynecology, according to the report.

STUDENTS

The only barrier to admission to a medical school should be unsuitability. Financial assistance should be given to medical students so that young people of ability are not deterred from entering the medical profession. Students should not be selected on the basis of examinations alone. Interviews are essential, and the possible development of aptitude tests is envisaged by the committee. There should be coeducation in all schools, and all hospital appointments should be filled by open competition, without any sex barrier. It is estimated that the places provided for women students should amount to about one fifth of the whole number.

CLINICAL INSTRUCTION

An introductory clinical course of planned scientific instruction, extending over not less than four months, is the best means of effecting a smooth transition from preclinical to clinical study, the report states. A medical student needs a coherently unified knowledge of medicine, which he has to acquire in an atmosphere of specialization and from teachers who, to an increasing extent, will be specialists. The teaching should be organized in five divisions: preclinical studies, pathology, medicine, surgery, obstetrics and gynecology. Under medicine should be included child health, psychiatry and social medicine. Clinical instruction should be continuous throughout the year, with emphasis on basic principles. Special attention should be paid to minor ailments and less to the technical details of surgical operations, the committee feels. There is need for more instruction in social medicine, child health and psychology. The total course up to the final examination should last four and one-half years. After passing, the student should have a junior resident's appointment for twelve months in one or more approved hospitals before admission to the medical register.

POSTGRADUATE EDUCATION

Postgraduate study should be a regular feature of general practice, it is claimed. The provision of periodic intensive refresher courses should be regarded as only a short term expedient. A better policy, according to the committee, is to bring general practitioners, by such means as clinical assistantships, into regular association with the work of hospitals and specialists. For specialists a minimum of four or five years' training after registration is proposed, and trainees should hold salaried appointments at teaching centers or special hospitals. As adequate training in tropical medicine cannot be obtained in this country, it is suggested that, having obtained his theoretical and laboratory instruction here, the student should hold an approved hospital appointment in a tropical country.

Industrial Rehabilitation Center Established by the Ministry of Labor

Much increased attention is now being given to rehabilitation. The Ministry of Labor has opened a center near London for industrial rehabilitation of male patients. It is realized that the complete use of available manpower, so essential for total war, demands the complete utilization of the individual worker. The center follows lines evolved by the army to meet this problem. It is equipped with workshops for various building and engineering occupations, and there are courses for handy men and gardeners, all under a highly qualified teacher. These facilities are used to test suitability for various occupations. The medical officer, who has undergone a course of special instruction, discusses with the manager the aptitude and potential capacity of each man, cooperates with him in the choice of employment and regulates progression of training on medical grounds. He has a staff of medical auxiliaries, including physical therapists. The remedial gymnastics are directed by a senior sergeant instructor of the Army Physical Training Corps, released for the purpose from a military convalescent depot.

Provision is made for entertainment, and particular attention is paid to the proper use of leisure.

The course is of six to eight weeks duration and is active in character. It is therefore not suitable for men in the earlier convalescent stages. On completing the course the men go either directly to employment in a previously held or some other occupation or are transferred to a vocational training center for a course in the new occupation chosen for them. The disabled man is in need of guidance in the choice of his future career, for his previous occupation may have been unsuitable for him. He requires the advice of a physician versed in the many sided aspects of rehabilitation and of an expert conversant with the demands of different industries. The man may regard his disability as the end of all his hope and, left to himself, may drift into unsuitable employment. The psychologic factor is therefore important, and the atmosphere and expert advice of the center are directed toward restoring confidence.

Profits of Proprietary Pills

At the sixteenth ordinary general meeting of Beechams Pills, Limited, it was announced that profits for the year ended March 31 earned by the companies of the group operating in the British Empire and in almost all parts of the world other than Europe amounted to \$7,000,000, as compared with \$6,000,000 in the previous year. The overseas trade was most satisfactory, the announcement said, and provides encouraging hope for the postwar period. The business commenced over one hundred years ago with the sale of the proprietary pill which gives its name to the company. During the past four years much time has been devoted to the development of overseas trade, it was stated.

PALESTINE

(From Our Special Correspondent)

TEL AVIV, July 14, 1944.

Epidemic of Louse Borne Typhus at the Dead Sea

In November 1943 an epidemic of louse borne typhus broke out among workers employed by the Palestine Potash Ltd. (Arabs from Hedjaz, Transjordan and neighboring countries). Following a positive Weil-Felix reaction in the first 2 cases, all suspected persons were sent to the hospital. All those who had been in contact with them were vaccinated, their personal effects were burned and the whole camp was disinfected. The energetic measures taken by Kupat Holim (the Workers' Sick Fund of the General Federation of Jewish Labor in Palestine), in cooperation with the Hebrew University and the government of Palestine, proved successful. In all, 10 persons occupying tents in the vicinity of the first victims contracted the disease. The last case occurred on Dec. 20, 1943. All the patients were in an undernourished condition and their standards of hygiene were at a low level. Two of the patients died.

Allergy in Palestine

Dr. I. Gutman of Jerusalem gives a survey of the condition of allergy in Palestine in the *Palestine and Near East Medical Journal* of December 1943 as follows:

About 3 per cent of the Jewish population of Palestine suffer from allergic diseases (major allergy), a figure far short of 10 per cent of the number submitted by American authors for America and somewhat lower than in Europe. In the Arab section of the population as well allergic diseases are of widespread occurrence. The most impressive factor which distinguishes Palestinian from European observations is the high proportion of susceptible children; the percentage in the pre-school age group in Palestine is more than twice as high as in Europe.

The distribution of allergic diseases in the various organs shows that bronchial asthma and vasomotor rhinitis account alike here and in Europe for more than 50 per cent of all

allergic patients. The main causative factors are "climate allergens," i. e. molds and fungi, in the humid warm atmosphere of the coastal regions. Skin diseases amount to about 25 per cent, excluding scrofula of infants. Allergic intestinal disturbances appear twice as often as in Europe, even without the colitis. This number is certainly still higher, considering that there are about three times as many sufferers from colitis in Palestine as from asthma. Hay fever appears less frequently, but then this illness is still little known here. Conjunctivitis vernalis (spring catarrh) is often encountered.

Extension of Hospital Accommodation in Haifa

Palestine has for many years suffered from a severe shortage of hospital accommodation, particularly in the Haifa district.

For every thousand persons in the Jewish section of the population of the country the available bed strength in the various districts of the country is as follows:

	Beds
In Jerusalem and vicinity.....	5.1
In Tel Aviv and the south of Palestine.....	1.4
In Haifa and vicinity	0.9
In the plain of Esdraelon and Galilee.....	2.7

Haifa is a port town and the center of heavy industry, as well as the gathering place of large numbers of new immigrants. The hospital which serves the Jewish community of Haifa has only small departments for surgery, maternity and children. For Haifa and its vicinity, which has a Jewish population of over 70,000, not a single hospital bed is available for internal diseases. In view of this situation the Kupat Holim (Sick Fund of the General Federation of Jewish Labor in Palestine) felt bound to purchase a building and adapt it as a small hospital, containing 40 beds. The cost of this building, with its renovation and equipment, will amount to \$125,000. Most of the beds will be devoted to cases of internal diseases. In accordance with an agreement arrived at with the Jewish Community Council of Haifa, it will admit Haifa residents even though they may not be members of Kupat Holim.

Medical Aid to the Red Army

The executive committee of the General Federation of Jewish Labor in Palestine, through its representative in London, has presented to the Russian ambassador, Mr. Maisky, the sum of £P 10,000 for the purchase of two fully equipped ambulances for the Red Army. At present a new shipment is being prepared of medically equipped field boxes, which, as the Soviet medical institutions have requested, contain medical instruments and materials for the use of doctors at the front. The nearer the Red armies approach the great day of victory, the more efficient becomes the service of the doctor who is equipped with a field box containing all the required appliances and instruments to render first aid to the wounded soldiers on the front.

Marriages

JOE LEE FRANK JR., Richmond, Va., to Miss Barbara Olive Bloxam of Roxboro, N. C., in Fayetteville, N. C., July 14.

EDWARD ARTHUR SHORTEN, Youngstown, Ohio, to Miss Mary Virginia Williams of Albion, Ill., July 8.

JOHN KELLER GRIFFITH JR., Slidell, La., to Miss Elizabeth Theriot of Gueydon in New Orleans, July 6.

WILLIAM E. SANDERS, Long Beach, Calif., to Miss Blanche Calvert of Des Moines in Pasadena, July 16.

ARTHUR SELDON MANN, Alton, Ill., to Lieut. Mildred Wiles of Seattle in England, July 14.

JOHN C. GLENN JR., Durham, N. C., to Miss Mary Eliza Ezzell of Rose Hill, July 7.

JAMES R. DWYER, Renovo, Pa., to Miss Anne Norton of Baltimore, July 24.

JOHN P. CREWS, Inverness, Miss., to Miss Nancy Curry in Knoxville, July 4.

Deaths

Willis Elliott Bowen * Rochester, N. Y.; Cornell University Medical College, New York, 1902; also a pharmacist; past president of the Rochester Academy of Medicine; member of the Rochester Hospital Council, Inc., and the Rochester Hospital Service Corporation; fellow of the American College of Surgeons; served during World War I; formerly on the staff of the Rochester City Hospital, now known as the Rochester General Hospital; a founder, one of the original board of directors, which he had served as president since March 1934, member of its executive committee and formerly chief of the surgical staff, Park Avenue Hospital, where he died July 11, aged 72, of Parkinson's disease, gallstones and diabetes mellitus.

Robert Lee Russell, Weaverville, N. C.; Columbian University Medical Department, Washington, D. C., 1901; joined the U. S. Indian Service, serving as agency and field physician at Rosebud, S. D., as agency physician at Anadarko, Okla., and as superintendent of the Sac and Fox Sanatorium, Toledo, Iowa; later chief of health in the Indian Service, stationed at Washington, D. C.; transferred to the Veterans Administration in 1920, from which he retired in 1940; formerly chief of the tuberculosis and general medical service at the Veterans Administration Facility in Oteen; served on the staffs of the U. S. Veterans hospitals in Fort Bayard, N. M., and Fort Lyon, Colo.; died in Asheville June 28, aged 73.

Richard Fenner Yarborough, Louisburg, N. C.; Columbian University Medical Department, Washington, D. C., 1898; honorary member of the Medical Society of the State of North Carolina; past president and secretary of the Franklin County Medical Society; a captain in the medical corps of the U. S. Army during World War I; formerly physician to the North Carolina State College for Agriculture and Engineering and member of the board of directors of the State Hospital in Raleigh; served as a member of the board of health of Franklin County and as county health officer; died June 22, aged 72, of coronary occlusion.

Percy Daniel Moulton * Colonel, U. S. Army, retired, Los Angeles; Jefferson Medical College of Philadelphia, 1907; graduated from the School for Flight Surgeons in 1921 and the Air Service Primary Flying School in 1925; served during World War I; entered the medical corps of the U. S. Army as a captain on Sept. 14, 1920 and later promoted to major, lieutenant colonel and colonel; retired Dec. 31, 1939; at one time instructor in pediatrics at his alma mater and on the staff of the Jefferson Hospital, Philadelphia; died in the Hoff General Hospital, Santa Barbara, Calif., Dec. 24, 1942, aged 61, of myocardial infarction.

William J. Blackburn * Dayton, Ohio; Pulte Medical College, Homeopathic, Cincinnati, 1900; University of Michigan Homeopathic Medical School, Ann Arbor, 1915; member of the American Academy of Ophthalmology and Otolaryngology; past president of the Ohio State Homeopathic Medical Society, Southern Homeopathic Medical Society and the Dayton Ophthalmological and Laryngologic Society; fellow of the American College of Surgeons; for many years a member of the staff and of the board of trustees of Miami Valley Hospital and a lecturer at the hospital's school of nursing; died July 16, aged 75.

John Joseph Sweeney, Doylestown, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1911; member of the Medical Society of the State of Pennsylvania; served overseas during World War I in the medical corps of the U. S. Army and was honorably discharged with the rank of major; for many years Bucks County coroner; chief Burgess of Doylestown; president of the city board of health; past president of the Kiwanis Club of Doylestown and president of the Second World War Memorial Committee; physician at the Bucks County Prison; died June 27, aged 57.

Leonard Francis Logiodice, Belchertown, Mass.; College of Physicians and Surgeons, Boston, 1920; member of the American Association on Mental Deficiency; served on the staffs of the Grafton State Hospital, North Grafton, and the Boston Psychopathic Hospital; received by the Pope in 1933; awarded two certificates of appreciation from the President for services rendered in the administration of the Selective Service System, local board number 34, Massachusetts; assistant physician on the staff of the Belchertown State School; died August 1, aged 56.

Frank Newton Wells, Pittsfield, Ill.; Chicago Homeopathic Medical College, 1895; member of the Illinois State Medical Society; served during World War I; lieutenant colonel in the medical reserve corps, not on active duty; past president and secretary of the Pike-Calhoun Counties Medical Society; at one time president of the school board of Cortland and Kirkland, Ill.; served as alderman and mayor of Pittsfield; for many years city and county physician; honorary member of the staff of the Illini Community Hospital; died June 27, aged 75.

Roy Wood Adkins, Fort Lauderdale, Fla.; Starling-Ohio Medical College, Columbus, 1911; member of the Ohio State Medical Association; died May 27, aged 57, of coronary heart disease.

Elias Marion Akins, Etowah, Tenn.; Chattanooga Medical College, 1903; died in Asheville, N. C., June 22, aged 70, of pulmonary tuberculosis.

James Ulysses Allen, Benton Harbor, Mich.; Rush Medical College, Chicago, 1923; member of the Michigan State Medical Society; served with Hospital Corps, 370th Infantry, American Expeditionary Forces, during World War I; served on the staff of St. Joseph Sanitarium, St. Joseph, and on the courtesy staff of the Mercy Hospital; died in the Provident Hospital, Chicago, July 4, aged 52, of cardiorenal disease.

Elsworth Frederick Arble, Carrolltown, Pa.; Baltimore Medical College, 1898; member of the Medical Society of the State of Pennsylvania; at one time first vice president of the Cambria County Medical Society; formerly a member of the board of health of Carrolltown and the school board; served during World War I; an organizer, former president of the board and staff member of the Miners' Hospital, Spangler, where he died July 5, aged 71, of hypertensive heart disease.

Wesley Lewis Boyden, Brillion, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1911; served overseas with the Thirty-Second Division, 127th Infantry Medical Unit, during World War I; for many years city physician of Brillion; formerly chief of staff, St. Mary's Hospital, Green Bay, where he died June 26, aged 56, of acute myocarditis and acute cholecystitis.

Arthur Mario Brianza, Chicago; College of Physicians and Surgeons of Chicago, 1892; at one time member of the city board of health; formerly on the staff of the Cook County Hospital; died at his home in Oak Park, Ill., July 11, aged 76, of angina pectoris.

Alfred William Brinham, Windber, Pa.; College of Physicians and Surgeons, Baltimore, 1905; member of the Medical Society of the State of Pennsylvania; for many years member of the board of health of Scalp Level; served as vice president of the Scalp Level Merchants and Miners Bank until it merged with the Windber Trust Company; died June 22, aged 63, of acute nephritis.

Elias Harry Brubaker * Flora, Ind.; Medical College of Indiana, Indianapolis, 1905; past president and secretary of the Carroll County Medical Society; died in the Home Hospital, Lafayette, June 28, aged 63, of a ruptured bladder following a prostatectomy.

John Thomas Burns * Kalamazoo, Mich.; University of Michigan Medical School, Ann Arbor, 1917; served overseas during World War I; on the staff of the Borgess and Bronson hospitals; died at his summer home in Gull Lake June 25, aged 55, of coronary disease.

David Clark Cather * Medical Director, Rear Admiral, U. S. Navy, retired, Herndon, Va.; University of Pennsylvania Department of Medicine, Philadelphia, 1903; commissioned a lieutenant (jg) in the medical corps of the U. S. Navy on June 9, 1904; later a lieutenant, lieutenant commander, commander, captain and rear admiral; retired Dec. 1, 1942 for incapacity incident to service; fellow of the American College of Surgeons; died in the U. S. Naval Hospital, Corona, Calif., June 25, aged 64, of pulmonary tuberculosis.

John Edward Curtis * Lemmon, S. D.; University of Louisville (Ky.) Medical Department, 1909; superintendent of the Perkins County Board of Health; president of the South Dakota State Public Health Association; died in an Aberdeen hospital May 6, aged 68, of coronary occlusion.

Floren Fred Davis, Clayton, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; member of the Illinois State Medical Society; died June 21, aged 64, of coronary heart disease.

Wirt Adams Duvall, Baltimore; University of Maryland School of Medicine, Baltimore, 1888; formerly chief surgeon

of the state police department and member of the state board of education; died June 17, aged 80, of chronic nephritis, arteriosclerosis and coronary occlusion.

William T. Easley, Houston, Texas; St. Louis College of Physicians and Surgeons, 1883; member of the Illinois State Medical Society and its "Fifty Year Club"; served as president, secretary and treasurer of the Bond County (Ill.) Medical Society; served as second lieutenant in the Fourth Regiment, Company F, Illinois National Guard, when the militia was active in Greenville; formerly coroner of Bond County; at one time member of the board of education in Greenville, Ill.; died June 20, aged 86, of hypostatic pneumonia following a fall.

Eli A. Fisher @ Yorkshire, Ohio; Medical College of Ohio, Cincinnati, 1888; past president of the Darke County Medical Society; died in the Wayne Hospital, Greenville, June 28, aged 80, of carcinoma of the stomach.

Samuel Watson Fox, Breton Woods, N. J.; Jefferson Medical College of Philadelphia, 1910; died June 22, aged 66, of cirrhosis of the liver.

Frank Joseph Gallagher, Tucson, Ariz.; University of Wooster Medical Department, Cleveland, 1912; fellow of the American College of Surgeons; served in the medical corps of the U. S. Army during World War I; served on the staffs of St. John's, St. Ann's Maternity and St. Alexis hospitals in Cleveland and St. Mary's Hospital; died June 22, aged 55, of pulmonary tuberculosis.

Pietro Giacchella, Altoona, Pa.; Regia Università di Torino Facoltà di Medicina e Chirurgia, Italy, 1896; one of the founders and member of the staff of the Mercy Hospital; died June 28, aged 79, of cerebral hemorrhage.

Edward Winchester Goodenough, Waterbury, Conn.; Yale University School of Medicine, New Haven, 1893; for many years clinical assistant in pediatrics at his alma mater; member of the Connecticut State Medical Society; formerly commissioner of education in Waterbury, medical inspector of schools, city supervisor and milk and food inspector; served on the staff of the Waterbury Hospital; died in the Masonic Home, Wallingford, July 10, aged 78.

Haynie Melvin Grace @ Chillicothe, Mo.; Missouri Medical College, St. Louis, 1891; a member of the chamber of commerce; formerly physician and surgeon to the State Industrial Home for Girls; died in the Major Clinic, Kansas City, June 13, aged 78, of cerebral thrombosis.

John Morton Greene, Falls City, Neb.; University of Louisville (Ky.) Medical Department, 1902; member of the Nebraska State Medical Association; served as president of the Richardson County Medical Society; on the staff of Our Lady of Perpetual Help Hospital; division surgeon for the Missouri Pacific Railroad; died June 10, aged 69, of coronary thrombosis.

Charles Wesley Hall, Mount Vernon, Ill.; Vanderbilt University School of Medicine, Nashville, Tenn., 1900; University and Bellevue Hospital Medical College, New York, 1901; member of the Illinois State Medical Society; served as president of the Southern Illinois Medical Society; a major in the medical corps of the U. S. Army and in charge of an evacuation hospital in France during World War I; died June 21, aged 63, of coronary occlusion.

Helen Willard Ham, Middleboro, Mass.; Tufts College Medical School, Boston, 1906; died April 30, aged 69.

Arthur Graham Harris, Fairfield, N. C.; University of the South Medical Department, Sewanee, Tenn., 1905; died in the Riverside Hospital, Newport News, Va., June 28, aged 67, of cirrhosis of the liver and arteriosclerosis.

Pleasant L. Henderson, Morristown, Tenn.; Bellevue Hospital Medical College, New York, 1896; member of the Tennessee State Medical Association; died June 18, aged 78, of complications attributed to injuries received in an automobile accident.

Edward Herbert @ Fall River, Mass.; Columbia University College of Physicians and Surgeons, New York, 1902; formerly district physician for the city of Fall River; died in a local hospital June 26, aged 69, of diabetes mellitus.

Stewart Felteau Hill, Macon, Miss.; University of Alabama School of Medicine, 1912; served during World War I; member of the board of aldermen of Macon; died June 14, aged 57, of carcinoma of the right lung.

Charles Edwin Homan Jr., New Orleans; Johns Hopkins University School of Medicine, Baltimore, 1923; member of the Louisiana State Medical Society; fellow of the American College of Physicians; formerly practiced in Chattanooga, Tenn.; at one time assistant medical director of the Connec-

ticut Mutual Life Insurance Company, Hartford; since January 1943 medical director of the Ochsner Clinic; died July 25, aged 46, of coronary thrombosis.

Robert Pearson Hooper, Kosciusko, Miss.; Memphis (Tenn.) Hospital Medical College, 1913; member of the Mississippi State Medical Association; served during World War I; died in Durant May 20, aged 56.

Arthur West Hopper, Washington, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1909; member of the Medical Society of the State of Pennsylvania; medical director of Washington and Green counties; died in the Western Pennsylvania Hospital, Pittsburgh, June 20, aged 62, of acute myocardial failure.

Mathew Marshall Huling, Winchester, Tenn.; Tennessee Medical College, Knoxville, 1902; for many years chairman of the Republican executive committee of Franklin County; secretary of the Franklin County Election Commission; formerly postmaster of Winchester; killed June 14, aged 71, when the automobile in which he was driving was struck by a truck.

Logan M. Kifer, McKeesport, Pa.; Jefferson Medical College of Philadelphia, 1878; member of the Medical Society of the State of Pennsylvania; died June 8, aged 90, of heart disease.

Adolph Frederick Konther @ Brooklyn; Long Island College Hospital, Brooklyn, 1902; consulting physician, Lutheran Hospital; died June 19, aged 78, of coronary thrombosis.

Francis Ferdinand Kramer @ Cincinnati; Medical College of Ohio, Cincinnati, 1905; a lieutenant in the medical corps of the U. S. Army during World War I; on the staffs of St. Mary's and St. Francis hospitals; died June 14, aged 62, of diabetes mellitus.

Nelson Egbert Laidacker, China, Texas; Medical College of Indiana, Indianapolis, 1903; member of the State Medical Association of Texas; veteran of the Spanish-American War; died May 25, aged 75.

Jefferson Brown Latta, Fort Bayard, N. M.; Columbia University College of Physicians and Surgeons, New York, 1905; veteran of the Spanish-American War and World War I; formerly a surgeon in the U. S. Public Health Service reserve; served on the staffs of various U. S. Veterans hospitals; pathologist at the Veterans Administration Facility, where he died June 8, aged 63, of carcinoma of the liver.

John Russell Leadsworth, Anaheim, Calif.; College of Physicians and Surgeons of San Francisco, 1897; died in a hospital at Fullerton June 4, aged 78, of Parkinson's disease.

Bedford E. Love, Roxboro, N. C.; University of Maryland School of Medicine, Baltimore, 1904; honorary member of the Medical Society of the State of North Carolina; past president of the Person County Medical Society; physician for the Norfolk and Western Railway; served as state highway and public works physician and county physician; on the staff of the Community Hospital; died June 15, aged 71, of cerebral hemorrhage.

Frank Benson Lucas, Yreka, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; at one time on the staffs of the Los Angeles County Hospital and the Hilts Hospital, Hilts; served with the Civilian Conservation Corps and the Indian Service; died at his country home in Hornbrook June 26, aged 76, of heart disease.

George W. MacMillan, Lakewood, N. J.; College of Physicians and Surgeons, Baltimore, 1890; died June 1, aged 81, of acute myocarditis and carcinoma of the lower lip.

James Patrick Magner, Bayonne, N. J.; Fordham University School of Medicine, New York, 1912; for many years police surgeon; president of the medical staff of St. Francis Hospital, where he had been a member of the staff for thirty years; died June 27, aged 54, of coronary occlusion.

Lucy Agnes Marraffino @ New York; Columbia University College of Physicians and Surgeons, New York, 1931; diplomate of the National Board of Medical Examiners; associate visiting physician, Misericordia Hospital; assistant visiting physician at the Gouverneur Hospital, where she was examining physician for the draft board; died in the New York Post-Graduate Medical School and Hospital June 6, aged 37, of postoperative embolus following cholecystectomy for cholelithiasis.

Irvin Hollis McDaniel, Alto, Texas; Chattanooga (Tenn.) Medical College, 1897; died May 15, aged 75, of Hodgkin's disease.

Onis Oliver Melton, Lowell, Ind.; University of Louisville (Ky.) Medical Department, 1910; served during World

War I; on the staff of St. Margaret Hospital, Hammond; died June 4, aged 59, of coronary thrombosis.

James Monroe Middleton, Many, La.; Vanderbilt University School of Medicine, Nashville, Tenn., 1890; served as a member of the first town council; one of the organizers of the first local bank, acting as vice president; chairman of the local school board for many years; president of the Sabine Parish Board of Health; died June 5, aged 77.

Elliott D. Moore, New Philadelphia, Ohio; Western Reserve University Medical Department, Cleveland, 1888; charter member of the New Philadelphia Rotary Club; formerly director of the Tuscarawas Savings and Loan Company; once president of the board of education; died June 15, aged 80.

John Marshall Mozley, Johnston City, Ill.; St. Louis College of Physicians and Surgeons, 1891; for many years city health officer; died June 26, aged 81, of carcinoma of the lungs.

Paul Nichols, New York; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1929; member of the Medical Society of the State of New York; died in the Mount Sinai Hospital June 29, aged 44, of acute leukemia.

Clarence Edgerton Owens, Columbia, S. C.; Medical College of the State of South Carolina, Charleston, 1910; member of the South Carolina Medical Association; died in the South Carolina Baptist Hospital May 27, aged 57.

Joseph N. Palt, Kenosha, Wis.; Illinois Medical College, Chicago, 1905; died in St. Catherine's Hospital May 31, aged 63, of cerebral hemorrhage.

Henry May Pond, Alameda, Calif.; University of California Medical Department, San Francisco, 1880; died in the Alameda Hospital June 6, aged 88, of arteriosclerotic heart disease.

Joseph Aloysius Richardson, Washington, D. C.; Medical College of the State of South Carolina, Charleston, 1917; died June 15, aged 55.

George J. Sabatier © New Iberia, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1889; served on the staff of the Dauterive Hospital; a director of the New Iberia State National Bank; died June 17, aged 81, of coronary thrombosis.

Norman A. Saylor, Philadelphia; Hahnemann Medical College of Philadelphia, 1880; died in the Philadelphia State Hospital, June 6, aged 86, of cardiac decompensation and chronic myocarditis.

James W. Scott, Detroit; Michigan College of Medicine and Surgery, Detroit, 1896; member of the Michigan State Medical Society; formerly on the staff of Michigan Home and Training School, Lapeer, Mich.; died in the Mount Carmel Mercy Hospital June 25, aged 75, of myocarditis.

Frank Winfred Shelton © Independence, Kan.; Kansas City (Mo.) Medical College, 1904; served during World War I; colonel, medical reserve corps, U. S. Army, not on active duty; died May 15, aged 68, of coronary occlusion.

John H. Shelton, Mayfield, Ky.; University of Louisville Medical Department, 1892; member of the Kentucky State Medical Association; president of the Graves County Medical Society; on the staff of the Mayfield Hospital; died June 2 while on a fishing trip, aged 79, of coronary occlusion.

Horace Watson Sherwood, Doland, S. D.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1896; member of the South Dakota State Medical Association and for many years councilor of the Second District;

past president of the Watertown District Medical Society; died in Madison August 5, aged 78, of cerebral hemorrhage.

Hugh P. Skiles, Chicago; the Hahnemann Medical College and Hospital, Chicago, 1880; died June 2, aged 92, of cerebral and cardiac arteriosclerosis, uremia and hypostatic pneumonia.

Clarence Luverne Smith © Seattle; State University of Iowa College of Medicine, Iowa City, 1923; specialist certified by the American Board of Pediatrics, Inc.; member of the American Academy of Pediatrics; served during World War I; chief of pediatric service, Children's Orthopedic Hospital; on the staffs of the Maynard and Seattle General hospitals; died April 23, aged 46.

Edward Elmer Smith, Columbus, Ohio; Starling-Ohio Medical College, Columbus, 1910; member of the Ohio State Medical Association; coroner of Franklin County since 1930; during World War I served in France with the 146th Ambulance Company, 112th Sanitary Train, 37th Division; active in the Ohio National Guard and had been commissioned a lieutenant colonel in the Ohio State Guard; member of the city board of health from 1925 to 1937, serving as president in 1932; died in the Grant Hospital June 18, aged 58.

William Henry Steers © Brooklyn; Bellevue Hospital Medical College, New York, 1890; during World War I a

lieutenant colonel in the medical corps, with the twenty-seventh division in France, and later with the Army of Occupation on the Rhine; served on the staffs of the Gouverneur Hospital, New York, and Brooklyn Eye and Ear Hospital; died May 31, aged 74.

Harry Bennett Weinburgh © Lansing, Mich.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; served during World War I; past National Commander of the Military Order of the Purple Heart; on the staffs of Edward W. Sparrow Hospital and St. Lawrence Hospital, where he died June 29, aged 62, of cerebral hemorrhage.

Fred C. Wood, Madison, Wis.; College of Physicians and Surgeons, Chicago, 1892; assistant physician, student health, University of Wisconsin; died June 4, aged 75, of coronary arterial disease.



LT. COL. BERNARD E. BULLOCK
M. R. C., U. S. A., 1912-1944



LT. (JG) CHARLES H. HENDERSON JR.
(MC) U.S.N.R., 1918-1944

KILLED IN ACTION

Bernard Eugene Bullock, Clinton, Okla.; Baylor University College of Medicine, Dallas, Texas, 1938; member of the Oklahoma State Medical Association; served an internship at the Kansas City General Hospital, Kansas City, Mo.; for two years city health officer; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on June 6, 1938; later promoted to major and lieutenant colonel; died in the European theater of operations June 10, aged 32, of wounds received in action.

Charles Herbert Henderson Jr., Bonny Blue, Va.; University of Virginia Department of Medicine, Charlottesville, 1943; intern at the Emory University Hospital, Emory University, Ga.; commissioned a lieutenant (jg) medical corps, U. S. Naval Reserve on Nov. 8, 1943; awarded Purple Heart posthumously; killed in action off the coast of France June 12, aged 25.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Ache-Knock Tablets.—In a stipulation entered into with the Federal Trade Commission in October 1943, Robert A. Stewart and Marie Phillips Stewart, trading as the Ache-Knock Company, Honolulu, T. H., agreed to discontinue the following advertising misrepresentations: That these tablets will relieve or cure rheumatism, sciatica, lumbago or neuritis, cure or prevent the recurrence of headache or toothache, relieve all pain or excessive acidity, and produce no ill effects. The respondents further stipulated that they would discontinue any claim to the effect that the product is superior to aspirin unless in immediate conjunction therewith they would make appropriate comparison of the relative liability to adverse effects following the use of Ache-Knock Tablets.

Alfamint, Minrich and Pretorius Liquifier.—In October 1943 Martin W. and Marie Pretorius, trading as Pretorius Approved Products, Glendale, Calif., stipulated with the Federal Trade Commission to discontinue the following misrepresentations in the sale of these products: That either Alfamint or Minrich can be depended on to give the user renewed vitality or purge the tissues of accumulated waste; that Alfamint, in either tea or tablet form, has any diuretic action which causes it to benefit the kidneys, or that it will increase the alkalinity of the blood, in neutralizing body acids or in adding needed minerals to the body; that Minrich improves digestion, supplies all the minerals lacking in the diet, or in any way helps to prevent or lessen the tendency of such conditions as loss of teeth, irregular heart action, rickets, nervousness, indigestion, anemia, infections, thyroid disturbances, low vitality or minor skin diseases; or that the use of liquid foods prepared by means of the Pretorius Liquifier, an electric mixing device, enables one suffering from nutritional deficiencies caused by an impaired digestive system to obtain necessary vitamins and minerals from raw vegetables, fruit and other food, with resultant regeneration of sick parts of the body.

Farrand Formulas.—These were sold by N. W. Farrand, trading as the Farrand Chemical Company, Tyrone, Pa., who, in October 1943, stipulated with the Federal Trade Commission that he would discontinue the following misrepresentations about the products made from his formulas: That "Cornox" would eliminate the pain of a corn as soon as applied; that "Machineless-Heatless Permanent Wave Fluid" would be harmless to the hair; that "Waterless Shave Cream" was capable of healing facial cuts and could not be purchased elsewhere for less than \$5; that his "Inhalants" would relieve or check colds and give instant aid in nasal congestion and infections; or that his "Asthma Remedies" and "Hay-Fever Remedies" would cure or permanently correct the ailments for which they were recommended. Farrand further agreed to discontinue any advertisements for, or instructions pertaining to, his formulas for the foregoing products which failed to reveal that the preparations compounded from them might be dangerous to health.

Pow-O-Lin.—This has been advertised as a treatment for indigestion, gas pains, headaches, nervousness, dizzy spells and other ailments by the Herb Juice-Penol Company, Inc., Danville, Va. In October 1943 that concern stipulated with the Federal Trade Commission that in future advertising it would reveal that Pow-O-Lin should not be used in cases of abdominal pain or other symptoms of appendicitis. It was provided, however, that the advertisements need contain only the statement, "Caution: Use only as directed" if the directions on the labeling include a warning to the same effect. It is worth noting that in December 1937 the Pow-O-Lin concern had entered into a stipulation with the Commission to cease advertising the product as being "Capable of relieving biliousness, nervousness, indigestion and countless ills due to constipation," unless these assertions are limited to temporary relief from constipation, and that in June 1940 the Commission definitely ordered the Pow-O-Lin concern to desist from making certain unwarranted implications in its advertising, such as that Pow-O-Lin is a cure or remedy for constipation and "faulty elimination" characterized by and associated with symptoms such as biliousness, indigestion, gas pains, headaches, dizziness, pains in the back or chest, stiffness of the joints, swollen feet or ankles, nervousness, insomnia, loss of appetite or lack of energy. These two earlier actions of the Commission were dealt with in The Journal for June 21, 1941, page 2811.

Seborol Scalp Lotion and Seborol Scalp Ointment.—These are put out by the Dermatological Products Corporation, Hoboken, N. J., which stipulated with the Federal Trade Commission in October 1943 that it would cease representing that the name "Seborol" is a registered trade mark in the United States Patent Office unless it is so registered.

Vanco Ointment.—This was represented by N. Edwards and Bertha Edwards, trading as Vanco Company, Brady, Neb., as a product that would prevent, cure or penetrate to the source of a cold, draw out congestion or pain or correct a sinus condition aggravated by a cold or be beneficial in pneumonia or influenza. In September 1943 the promoters entered into a stipulation with the Federal Trade Commission, agreeing to discontinue the foregoing misrepresentations.

Vita-Rex Capsules.—These are put out by one Joseph Giannatelli, trading as Alba Bio-Products Company, Chicago, who entered into a stipulation with the Federal Trade Commission in October 1943 in which he agreed to discontinue the following misrepresentations: That this product has any value in the treatment of poor assimilation, constipation, indigestion, gaseous conditions of the stomach or intestines, functional weakness or nerve disorders; that it will enrich the blood, improve the appetite, correct gastrointestinal disorders, increase systemic resistance or produce better feeling; that it will protect individuals against colds, aches or a tired-out feeling, supply the body with ample nutritional substances, and possesses value as an iron preparation.

Yog-A-Lax.—That this laxative is a stomach or bowel corrective and is not habit forming were misrepresentations which the Yoghurt Products, Inc., of Seattle agreed to eliminate from their advertising in a stipulation that they entered into with the Federal Trade Commission in October 1943. They further agreed to discontinue any advertisement which failed to reveal that the product should not be used when abdominal pains or other symptoms of appendicitis are present, provided, however, that such advertisements need contain only the statement, "Caution: Use only as directed" if the directions for use on the label contain a warning to the same effect.

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

(EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D.D.N.J. and foods, F.N.J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.)

Arnold Garlic Tablets.—Melrose Drug Company, Cleveland. Shipped Jan. 21, 1942. Composition: essentially starch and garlic. Misbranded because statement on carton, "May be of Value in Reduction of Hypertension" was false and misleading, since product contained no ingredients to justify the statement.—[D.D.N.J., F.D.C. 779; September 1943.]

Davis Formula No. 7895.—E. R. Davis Prescription Company, Bellingham, Wash. Shipped Dec. 17, 1941, and June 23, 1942. Composition: essentially water, alcohol, potassium iodide, chloroform, sugar, and an extract of a plant drug, such as lobelia; supplementary bottle contained a solution of vitamin A. Misbranded because labeling falsely represented that this combination was an adequate treatment for asthma, hay fever, eczema or rheumatic, neuritic or arthritic pains.—[D.D.N.J., F.D.C. 780; September 1943.]

Fermilax.—Moon-Winn Drug Company, Inc., Athens, Ga. Shipped March 11, 1942. Composition: essentially sodium bicarbonate, magnesium and calcium carbonates, bismuth subnitrate and rhubarb. Misbranded because label directions provided for continuous administration, whereas product was a laxative and should not be used continuously, and because directions failed to give the dosage for children of different ages. Further misbranded because labeling failed to warn that a laxative should not be taken in case of nausea, vomiting, abdominal pain or other symptoms of appendicitis, and that frequent or continued use of a laxative might result in dependence on it to move the bowels. Also misbranded because label failed to declare an accurate statement of quantity of contents.—[D.D.N.J., F.D.C. 760; September 1943.]

Ramsdell's Sulphur Cream.—E. Fougere & Company, Inc., New York. Shipped April 22, 1942. Composition not reported. Adulterated because strength differed from that which it was represented to possess, namely, "Contains 10% Precipitated Sulphur." Misbranded because of false label representations that it would be efficacious in treating scabies, eczema, ringworm, itching, simple acne, acne rosacea, burning and soreness in eczema and water rash, as well as bald spots and falling hair.—[D.D.N.J., F.D.C. 772; September 1943.]

Vita Night Capsules.—Vital Foods Corporation, Chicago. Shipped Feb. 28, 1942. Composition (black capsules): dicalcium phosphate, peptonized iron, magnesium sulfate, manganese hypophosphite, copper peptonate, zinc sulfate and potassium iodide; (red capsules) shown by vitamin assays to contain, per capsule, 10,000 U. S. P. units of vitamin A and 1,000 U. S. P. units each of vitamins B₁ and D. Misbranded because black capsules contained smaller amounts of minerals than those declared, and labeling of both kinds bore false and misleading claims as to their supposed benefits in many disorders, such as lessened strength, poor sleep, aches, pains, nervous strain and some other things.—[D.D.N.J., F.D.C. 786; September 1943.]

Correspondence

FACTS ABOUT CHILDREN'S BUREAU CONFERENCE ON CHILD CARE

To the Editor:—My attention has been called to the Washington letter in *THE JOURNAL*, August 12, headed "American Academy of Pediatrics Withdraws Support from Children's Bureau." In this letter the following statement is made:

Last month a conference of child specialists and social workers here took a stand against the bureau's group care of children, asserting that group care was damaging to child welfare and actually more expensive than a foster family system of care which the conferees advocated.

This statement is false. The Children's Bureau does not conduct group care of children. We have consistently taken a position against group care of children under the age of 2 years.

On July 30 and Aug. 1, 1941 the Children's Bureau held a conference on day care of children of working mothers which adopted certain recommendations including the following: "Infants should be given individual care, preferably in their own homes and by their own mothers." The Standards for Day Care of Children of Working Mothers, published in February 1942, contains the following statement:

If it is necessary to provide for children under 2 years of age provision should be made for care in the children's own homes through supervised homemaker service or in carefully selected and supervised foster homes. Infants should not be cared for in groups.

This has been the policy of the Children's Bureau throughout the war period.

The only federal funds now available for day care services are Lanham Act funds administered by the Federal Works Agency. This summer, for the first time, applications for funds to conduct group care services for children under 2 years of age came to the Federal Works Agency and, in accordance with agreed policies, were referred to the Children's Bureau for its review. I took the position that we could not pass upon these policies for group care of infants under 2 without having the advice of the most competent experts from the fields of health, child development and social service. Accordingly I called a conference, which met on July 10, 1944. Among others attending the conference were Dr. Marian C. Putnam, director, Children's Center, Roxbury, Mass.; Dr. Milton Senn, assistant professor of pediatrics and psychiatry, Cornell University Medical College; Dr. Benjamin Spock, assistant attending pediatrician, New York Hospital (now Lieutenant Commander in the Navy), and Dr. Arnold Gesell, director of the Clinic of Child Development and Attending Pediatrician, New Haven Hospital.

The conference upheld the policy of the Children's Bureau with reference to infants and recommended against group care of infants under the age of 2 years. This recommendation was transmitted by the Children's Bureau to the Federal Works Agency, and the Children's Bureau is now cooperating with the Federal Works Agency in the review of an application for funds for group care of infants in San Diego, Calif., with a view to determining whether it would not be possible to provide for infants in foster families.

KATHARINE F. LENROOT, Washington, D. C.
Chief of the Children's Bureau.

TREATMENT OF POLIOMYELITIS

To the Editor:—I feel that physicians should be warned against the use of sulfonamide drugs in the treatment of poliomyelitis.

It has been noticed clinically that when paralyzes of the intestine and urinary bladder persist there are apt to be extensions of the somatic paralyzes. When urinary retention was produced in animals (monkeys) by the use of sulfonamide compounds, drugs which produced urethritis and blockage of the ureters, a more massive disease was produced two or three days sooner than that which appeared in controls simultaneously injected with poliomyelitis virus.

Rosenow had the same experience with sulfapyridine at the Mayo Clinic and reported that this drug produced an additive neurotoxic effect.

Recently an explosive epidemic of poliomyelitis occurred in a small town of northern Ohio. The number of patients that developed severe paralysis seemed out of proportion to the normal expectancy. Most of these patients had received sulfonamide drugs (information received from Mrs. Louise Bowers, health officer, Perrysburg, Ohio).

Recently a 12 year old girl had signs of meningeal irritation, but no sign of any muscle involvement save in one leaf of the soft palate. The reflexes were hyperactive; the child was not acutely ill. The spinal fluid, checked twice, contained 220 cells, all of which were polymorphonuclears. Gram negative organisms had been reported. The prognosis seemed good whether the condition was poliomyelitis or meningitis. Sulfadiazine was started. Twelve hours later and after 12 Gm. of sulfadiazine had been given, a massive extension of paralysis suddenly developed, the throat muscles and intercostals all becoming affected within an hour. This sudden explosive extension in an otherwise nearly normal patient had not been our previous experience in this type of case.

The sulfonamide drugs are of no value in poliomyelitis. Nor does penicillin help much in our experience, although we have not noticed that it does harm.

JOHN A. TOOMEY, M.D.,
Department of Contagious Diseases,
City Hospital, Cleveland.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL*, Aug. 19, page 1155.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Nov. 13-15. Part III. Various centers, September or October. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written*. Part I. Various centers, Jan. 19. Final date for filing application is Oct. 21. Sec., Dr. P. M. Wood, 745 Fifth Ave., New York 22.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written*. Part I. Various centers, February. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: Los Angeles, January. Final date for filing application is Oct. 1. New York, June. Chicago, October, 1945. Final date for filing application is Dec. 1. Sec. Dr. S. Judd Beach, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral*. Chicago, Oct. 4-7. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Oral*. New York, April 14-15. Final date for filing application is Dec. 15. Chicago, May 19-20. Final date for filing application is Jan. 19. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY: *Oral*. New York, December. Final date for filing application is Sept. 30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington 6, D. C.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Right of Court Reviewing Revocation of License to Receive Evidence in Addition to Evidence Heard by Board: Disturbance of Peace as Unprofessional Conduct.—Wyatt, who was licensed to practice medicine in California, was placed on probation in 1940 for five years by the Board of Medical Examiners of California on charges of the nature of which the reported decision makes no mention. In 1942 proceedings were instituted to revoke his license for violating probation on a charge that (1) he had attempted to procure on two named women miscarriages that were not necessary to save their lives and (2) that he had been guilty of an offense involving moral turpitude, a cause of revocation, because he had been convicted of disturbing the public peace and quiet by the use of profane and indecent language. At the hearing before the board the physician and the named women denied that the women had been pregnant and that miscarriages had been procured with respect to them. A nurse, however, employed by the physician testified that she assisted the physician in performing the operations in question and that the physician curetted the wombs of both women and removed a fetus from one of them which, she testified, was about a month old. The board found the charges sustained and revoked the physician's license to practice. The physician then instituted mandamus proceedings against the individual members of the board to compel them to cancel the order revoking his license. The trial court heard all the evidence that was adduced before the board and in addition heard the testimony of another physician, who stated that a fetus of an age of 4 weeks, the age of the one the nurse testified she had seen removed, would be the size of a buckshot and the nature of such a substance could be ascertained only by the use of a microscope. The trial court found the evidence insufficient to sustain the charges preferred with the board and ruled in favor of the physician, and the board appealed to the district court of appeal, first district, division 2, California.

The board contended first that it was error in a hearing on a petition for writ of mandate for the trial court to hear evidence in addition to that heard by the board. The board argued that evidence additional to that received at its hearing could be considered by a reviewing court only (1) where evidence has been offered and improperly rejected by the administrative agency whose acts are under review, (2) where pertinent evidence was in existence at the time of the hearing before the administrative agency but could not have been at the time produced by the exercise of due diligence and (3) evidence discovered subsequent to the hearing before the administrative agency. The court, however, could not agree with this contention, relying on *Laine v. California State Board of Optometry*, 19 Cal. 2d 831, 123 P. 2d 457. In that case the court said:

If, in the instant case, the superior court in the mandate proceeding were limited to the evidence presented before the board, or if the findings of fact by the board were conclusive on the court, then the board would be exercising the complete judicial power reserved to the enumerated courts . . . and appellant would be deprived of his constitutional right unless he had a right to go into a court of law and question the validity of that order by the introduction of any material evidence to prove that he did not commit the acts alleged.

The board next argued that its action in revoking the physician's license was justified from the evidence before it that the physician had been convicted of disturbing the peace, which is an act of moral turpitude. The vice in this contention, answered the court, is that it assumes that the offense of disturbing the peace is an act of moral turpitude. That it is an act of moral turpitude may be conceded. However, it is equally clear that

it is not ipso facto an immoral act. If and when it is claimed that such an act is one of moral turpitude the trial court may inquire into such facts as show or tend to show that the offense complained of was or was not an act of moral turpitude. In the case before us such evidence was produced by the physician. Thereafter the trial court made findings that the offense alleged to have been committed by the physician in disturbing the peace was not one of moral turpitude. That finding is conclusive on an appellate court.

For the reasons stated, the appellate court affirmed the order of the trial court directing, in effect, that the physician's license to practice be restored to him—*Wyatt v. Cerf*, 149 P. 2d 309 (Calif., 1944)

Society Proceedings

COMING MEETINGS

- Aero Medical Association of the United States, St. Louis, Sept. 4-6. Dr. David S. Brachman, 5440 Cass Ave., Detroit 2, Secretary.
- American Academy of Neurological Surgery, White Sulphur Springs, W. Va., Sept. 7-9. Dr. Theodore C. Erickson, Wisconsin General Hospital, Madison, Wis., Secretary.
- American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 8-12. Dr. W. L. Benedict, 102 Second Ave. S.W., Rochester, Minn., Secretary.
- American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Hot Springs, Va., Sept. 7-9. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.
- American Congress of Physical Therapy, Cleveland, Sept. 6-9. Dr. Richard Kovacs, 2 East 88th St., New York 28, Secretary.
- American Hospital Association, Cleveland, Oct. 2-6. Mr. George P. Bugbee, 18 East Division St., Chicago, Executive Secretary.
- American Pediatric Society, Atlantic City, N. J., Sept. 25-27. Dr. Hugh McCulloch, 325 N. Euclid Ave., St. Louis 8, Secretary.
- American Public Health Association, New York, Oct. 3-5. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, Executive Secretary.
- American Roentgen Ray Society, Chicago, Sept. 24-29. Dr. H. Dabney Kerr, University Hospitals, Iowa City, Secretary.
- Association of American Medical Colleges, Detroit, Oct. 23-25. Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary.
- Colorado State Medical Society, Denver, Sept. 27-29. Dr. John S. Bouslog, 537 Republic Bldg., Denver 2, Secretary.
- Delaware, Medical Society of, Lewes, Sept. 11-12. Dr. W. O. La Motte, 601 Delaware Avenue, Wilmington, Secretary.
- District of Columbia, Medical Society of the, Washington, Oct. 5-7. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.
- Indiana State Medical Association, Indianapolis, Oct. 3-5. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis 4, Executive Secretary.
- Inter State Postgraduate Medical Association of North America, Chicago, Oct. 17-20. Dr. Arthur G. Sullivan, 16 N. Carroll St., Madison, Wis., Managing Director.
- International College of Surgeons, U. S. Chapter, Philadelphia, Oct. 3-5. Dr. Desiderio Roman, 250 South 17th St., Philadelphia, Secretary.
- Kentucky State Medical Association, Lexington, September 18-20. Dr. P. E. Blackerby, 620 S. Third St., Louisville, Secretary.
- Michigan State Medical Society, Grand Rapids, Sept. 27-29. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Secretary.
- Mississippi Valley Medical Society, Peoria, Ill., Sept. 27-28. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.
- Omaha Mid West Clinical Society, Omaha, Nebraska, Oct. 23-27. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha 2, Secretary.
- Pennsylvania, Medical Society of the State of, Pittsburgh, Sept. 19-21. Dr. Walter F. Donaldson, 500 Penn. Ave., Pittsburgh 22, Secretary.
- Radiological Society of North America, Chicago, Sept. 24-29. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Virginia, Medical Society of, Richmond, Oct. 23-25. Mrs. Arnes V. Edwards, 1200 E. Clay St., Richmond 19, Secretary.
- Wisconsin, State Medical Society of, Milwaukee, Sept. 18-20. Mr. Charles H. Crownhart, 110 E. Main St., Madison 3, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

13:381-440 (June) 1944

Value and Limitation of Laboratory Tests in Clinical Medicine. T. R. Harrison.—p. 381.

Intestinal Obstruction. E. F. Moody.—p. 385.

Simplified Chin Support. C. J. Thuss.—p. 387.

14:1-24 (July) 1944

The Nervous Patient. G. O. Segrest.—p. 1.

Treatment of Craniocerebral Wounds. C. Pilcher.—p. 5.

Skin Grafting, with Special Reference to Split Thickness Skin Graft. J. L. Carmichael.—p. 11.

American Journal of Medical Sciences, Philadelphia

207:701-832 (June) 1944

Thiouracil Storage in Thyroid as Affected by Thyrotropic Hormone and Potassium Iodide. R. H. Williams, A. R. Weinglass and Gloria A. Kay.—p. 701.

Interference Between Inactive and Active Viruses of Influenza: I. Incidental Occurrence and Artificial Induction of Phenomenon. W. Henle and Gertrude Henle.—p. 705.

Id.: II. Factors Influencing the Phenomenon. W. Henle and Gertrude Henle.—p. 717.

One Year Observations of Treatment of Cancer with Avidin (Egg White). I. I. Kaplan.—p. 733.

Concentration of Red Blood Corpuscles Containing Labeled Phosphorus Compounds in Arterial Blood After Intravenous Injection: Preliminary Report. G. Nylin and M. Malm.—p. 743.

*Evaluation of Alcohol Lumbar Paravertebral Block in Peripheral Vascular Disease. G. Saland and C. Klein.—p. 749.

Amebiasis: Analytic Study of Cases Admitted to Philadelphia Hospital During Last Five Decades. R. S. Diaz-Rivera and E. A. Rasberry.—p. 754.

*Trichinella Skin Tests in Patients in General Hospitals and Tuberculosis Sanatoriums. S. F. Horne and G. T. Harrell.—p. 759.

Heart Block: Study of 100 Cases with Prolonged PR Interval. R. B. Logue and J. F. Hanson.—p. 765.

Neuropsychiatric Casualties from Guadalcanal: I. Persistent Symptoms in 3 Cases. A. A. Rosner.—p. 770.

Tumefaction of Subcutaneous Fat Following Injection of Insulin: Chemical and Histologic Study. H. T. Engelhardt and V. J. Derbes.—p. 776.

Alcohol Lumbar Paravertebral Block in Peripheral

Vascular Disease.—Saland and Klein tried to determine objectively (1) exactly how long one may expect vasodilatation effects to last after alcohol paravertebral block in the lumbar region, (2) whether neuritis is produced by such a procedure and, if so, how often, how severe and how long such neuritis might last, (3) whether the amount of alcohol used was a factor in producing vasodilatation or neuritis, (4) whether the use of procaine hydrochloride in sweet almond oil would reduce the incidence of neuritis and (5) whether claudication time would be altered by such therapy. The patients studied were those who applied to the vascular clinic for relief of symptoms and comprised a total of 16. The types of cases were 1 phlebitis, 1 scleroderma, 1 thromboangiitis obliterans and 13 arteriosclerosis obliterans. These cases were chosen because it was determined previously by peripheral nerve block with procaine hydrochloride that the extremity to be treated could vasodilate up completely. In 6 cases the authors used 2 per cent procaine hydrochloride followed by 5 per cent procaine hydrochloride in sweet almond oil, and this in turn by 1 cc. of 100 per cent alcohol; in 4 cases 2 per cent procaine hydrochloride followed by 1 cc. of 100 per cent alcohol; in 6 cases 2 per cent procaine hydrochloride followed by 3 cc. of 100 per cent alcohol. The authors arrive at the following conclusions: 1. The use of 100 per cent alcohol in lumbar paravertebral block is of definite value in producing peripheral vasodilatation. This vasodilata-

tion may be complete and may last for varying periods of time, even up to two years and perhaps longer. 2. The neuritis occurs more often when larger amounts of alcohol are injected; it is not too severe and in no instance has lasted more than forty-five days. 3. The use of procaine hydrochloride in sweet almond oil did not reduce the incidence of neuritis. 4. Vasodilatation occurred more often when larger amounts of alcohol were used, but the amount of alcohol was not the factor that determined how long this vasodilatation lasted. 5. There was no correlation between claudication time and the degree or duration of vasodilatation.

Trichinella Skin Tests.—Horne and Harrell used a 1:10,000 trichinella extract to perform skin tests on 700 patients, namely on 278 consecutive admissions to the North Carolina Baptist Hospital, 144 patients at the Forsyth County Hospital, 120 patients at the Guilford County Tuberculosis Sanatorium and 158 patients at the Western North Carolina Tuberculosis Sanatorium. Seventy, or 10 per cent, of the 700 patients gave positive skin reactions. This is lower than similar studies have shown in some other areas of the United States. The incidence found by skin tests was greater than that found in routine necropsies in the same geographic area. The incidence was greater among Negroes and in males but was not statistically significant in either. The incidence of positive tests was essentially the same in urban and rural groups. Patients with active tuberculosis in two sanatoriums gave a higher proportion of positive reactions (14.3 per cent) than did those without tuberculosis (7.1 per cent) in two general hospitals. Almost all of the patients with tuberculosis were in two sanatoriums; it is possible that these findings represent the result of two local, unrecognized or subclinical epidemics. Other possible explanations are that patients with tuberculosis develop skin sensitivity with much lighter infestations or retain sensitivity longer than do nontuberculous patients or that their skin is more reactive to intradermal tests in general. However, personal communications from men with experience in treating tuberculosis indicate that, in general, they have not found their patients more reactive to intradermal tests than nontuberculous persons.

American Journal of Ophthalmology, Cincinnati

27:589-686 (June) 1944

Exophthalmos of Hyperthyroidism: Differentiation in Mechanism, Pathology, Symptomatology and Treatment of Two Varieties: Part I. J. H. Mulvany.—p. 589.

Sugar Content of Cataractous Human Lenses. P. W. Salit.—p. 612.

Pneumoencephalocoele Secondary to Puncture Wound of Lid. H. Slaughter and B. Y. Alvis.—p. 617.

Ophthalmoplegia and Retinal Degeneration. Ruth I. Barnard and R. O. Scholz.—p. 621.

Use of Doryl in Glaucoma. J. F. Hardesty.—p. 625.

Keratoconjunctivitis Caused by Manzanillo Tree. R. D. Harley.—p. 628.

*Actinic Keratoconjunctivitis. R. G. Scobee and E. W. Griffey.—p. 632.

Correction of External Rectus Paralysis with Contracture of Opposing Internus. P. H. Reinhardt.—p. 636.

Actinic Keratoconjunctivitis.—Scobee and Griffey found the following treatment highly satisfactory for keratoconjunctivitis or flash burn: Once the diagnosis is made, the patient is rendered comfortable by the instillation of a corneal anesthetic; 0.5 per cent pontocaine is a good, quick acting one. Following anesthesia, three instillations of 1:1,000 epinephrine at five minute intervals are made; if the patient is seen soon after the onset of ocular pain and before vascular congestion has reached a maximum, this is all that is necessary. Usually such patients gain immediate and frequently permanent relief, enabling them to return to work at once. If vasodilatation is severe the aforementioned routine is followed, and in addition the patient is given holocaine and epinephrine ophthalmic ointment to be used in the eye every three hours. One early sign of a severe burn is a miotic pupil. One per cent atropine ophthalmic ointment is instilled, but several repetitions may be necessary before mydriasis is secured. In the more severe burns, or in those which are not seen until forty-eight to ninety-six hours after the burn has occurred, more drastic therapy may be indicated. Chemosis and a mucopurulent secretion in addition to palpebral edema are all a part of the entity of flash burn and are not on an infective basis. Cold packs and holocaine and epinephrine ointment are usually sufficient. Occasionally a seda-

tive is necessary. Either corneal or conjunctival ulceration or both must be dealt with apart from flash burn. Corneal ulcers thus formed are indolent. Chemical cauterization, intravenous typhoid, vitamin therapy (riboflavin and ascorbic acid), ethylmorphine hydrochloride and methylene blue powder may be tried. As long as corneal staining persists, the eye should be kept closed with an eye pad.

American Journal of Physiology, Baltimore

141:439-612 (June) 1944. Partial Index

- Estimation of Platelet Fragility. M. E. Muhrer, R. Bogart and A. G. Hogan.—p. 449.
Effect of Caffeine on Gastric Secretion in Dog, Cat and Man. J. A. Roth and A. C. Ivy.—p. 454.
Influence of Agents Affecting Autonomic Nervous System on Motility of Small Intestine. E. J. Van Liere, D. W. Northup and J. C. Stickney.—p. 462.
Effect of Adrenal Medullectomy on Hereditary Diabetes of Strain of Rats. G. Sayers, M. Sayers, J. D. Plekker, A. U. Orten and J. M. Orten.—p. 466.
Excretion of Urea by Normal Subjects Under Basal Conditions. R. S. Hubbard and F. R. Griffith Jr.—p. 469.
Effect of Intrahepatic Pressure on Bile Resorption During Obstructive Jaundice. B. G. P. Shafroff, H. Doubilet, I. S. Barcham and Co Tui.—p. 480.
Acoustic Alterations of Postcontraction Hypertonus in Limb Muscles of Normal Man. H. S. Wells.—p. 486.
Sodium Ion Movement Between Intestinal Lumen and Blood. M. B. Visscher, R. H. Varco, C. W. Carr, R. B. Dean and Dorothy Erickson.—p. 488.
Pepsin Content of Gastric Juice Secreted in Response to Hormonal Stimulation. M. Grossman, J. R. Woolley and A. C. Ivy.—p. 506.
Enzyme Content of Pancreatic Secretion Following Various Stimulants. H. Greengard, M. I. Grossman, R. A. Roback and A. C. Ivy.—p. 509.
Blood Flow, Peripheral Resistance and Vascular Tonus, with Observations on Relationship Between Blood Flow and Cutaneous Temperature. H. D. Green, R. N. Lewis, N. D. Nickerson and A. L. Heller.—p. 518.
Effect of Histamine and Hydrochloric Acid on Gastric Secretion and Potential. W. S. Rehm.—p. 537.
Hypophysial Eosinophil Cell and Insulin Sensitivity. P. Heinbecker and Doris Rolf.—p. 566.
Local Loss of Fluid and Protein in Experimental Shock: Relation to Decrease of Plasma Volume and Total Circulating Proteins. C. T. Ashworth, A. W. Jester and E. L. Guy.—p. 571.
Factors Influencing Chloride Concentration in Human Sweat. R. E. Johnson, G. C. Pitts and F. C. Consolazio.—p. 575.
Adrenalectomy, Gonadectomy and Insulin Content of Pancreas. R. E. Haist and H. J. Bell.—p. 606.

American Journal of Psychiatry, New York

100:727-870 (May) 1944. Partial Index

- Electroencephalogram in Post-Traumatic Epilepsy. F. A. Gibbs, W. R. Wegner and E. L. Gibbs.—p. 738.
Post-Traumatic Epilepsy. W. Penfield.—p. 750.
Experiment in Postgraduate Education. C. A. Rymer and F. G. Ebaugh.—p. 752.
Historical Sidelights on Problem of Delinquency. G. Zilboorg.—p. 757.
Psychiatric Study of 250 Sex Offenders. B. Apfelberg, C. Sugar and A. Z. Pfeffer.—p. 762.
Comparative Statistical Study of Male and Female Drug Addicts. M. J. Pescor.—p. 771.
Neurology and Psychiatry in Palestine. L. Halpern.—p. 775.
Measurement of Remembering. F. Feldman and D. E. Cameron.—p. 788.
Four Years' Experience with Music as Therapeutic Agent at Eloise Hospital. I. M. Altschuler.—p. 792.
Etiology of Mental Disease, Changing Concept. G. S. Sprague.—p. 795.
*Amphetamine Sulfate in Aborting Acute Alcoholic Cycle. M. M. Miller.—p. 800.
Schizophrenia in 4 Year Old Boy. H. R. Blank, O. C. Smith and H. Bruch.—p. 805.
Study of Prodromal Factors in Mental Illness, with Special Reference to Schizophrenia. Mary Phyllis Wittman and D. L. Steinberg.—p. 811.
Neuropsychiatry in General Hospital. T. J. Heldt.—p. 817.
Rapid Changes in Oxygen Tension of Cerebral Cortex During Induced Convulsions. E. W. Davis, W. S. McCulloch and E. Roseman.—p. 825.
Clinical and Electroencephalographic Studies in Obsessive-Compulsive States. B. L. Pacella, P. Polatin and S. H. Nagler.—p. 830.

Amphetamine Sulfate in Aborting Acute Alcoholic Cycle.—To test the effects of amphetamine sulfate, Miller made studies on 30 persons with suspended sentences, referred from the Cleveland Municipal Court, and 26 private patients. All were nonpsychotic, chronic alcoholic addicts treated during the acute postintoxication period. The average duration of alcoholism was sixteen years. The procedure consisted of amphetamine sulfate 10 mg. administered orally twice daily after breakfast

and after lunch, phenobarbital 1½ grains (0.1 Gm.) at bedtime and thiamine hydrochloride 30-40 mg. daily. The patients were told to include large amounts of sugar in their diet. Tepid reclining baths were ordered mornings and evenings and bed rest was recommended when indicated. In 8 control patients placebos were substituted for amphetamine sulfate; otherwise the treatment was identical. The acute drinking cycle was interrupted in 49 of the 56 patients, with subsequent periods of abstinence ranging from one to eighteen months or longer. Seven patients failed to respond satisfactorily. The cycle was not interrupted in the control group treated with placebos. It was found that physical and mental "hangover effects" were much reduced by amphetamine sulfate. Improvement in awareness, sensory perception and activity drive was observed soon after treatment. Mood and rapport were improved, patients demonstrating greater cooperation, increased accessibility and decreased negativism, thus facilitating the initiation of a rehabilitative program.

American Journal of Public Health, New York

34:567-692 (June) 1944

- Epidemic Keratoconjunctivitis: Correlation of Epidemiologic Data and Results of Serum Virus Neutralization Tests. R. F. Korn, M. Sanders and R. C. Alexander.—p. 567.
Epidemic Keratoconjunctivitis—Detroit Experience. J. G. Molner and E. L. Cooper.—p. 572.
Current Progress in Sterilization of Air. S. Mudd.—p. 578.
Nutritive Value of Canned and Dehydrated Meat and Meat Products. E. E. Rice and H. E. Robinson.—p. 587.
Nutritive Values of Canned Fruits and Vegetables. J. F. Feaster.—p. 593.
Sanitary Engineering in Latin America. H. B. Gotaas.—p. 598.
Case Method in Teaching Public Health Administration. H. D. Chope.—p. 605.
Epidemiology of Cancer from Viewpoint of Health Officer. M. L. Levin.—p. 611.
Serologic Identification of Dysentery Bacilli. K. M. Wheeler.—p. 621.
Nutrition: Factor Important for Industrial Hygiene. G. R. Cowgill.—p. 630.
Chest X-Ray Survey Methods in Practice. A. B. Robins.—p. 637.
Gonococcus Cultures—State Laboratory Service. Margaret W. Higginbotham.—p. 643.
Block Organization for Health Education. H. Y. McClusky.—p. 648.
Preparing High School Students for Community Service. G. L. Davis.—p. 652.

American Journal of Surgery, New York

64:297-434 (June) 1944

- Paralytic Scoliosis: Analysis of 51 Cases. S. Kleinberg.—p. 301.
Efficacy of Ultraviolet Blood Irradiation Therapy in Control of Staphylococcemias. G. Miley.—p. 313.
Synergistic Mixture of Azochloramid, Urea and Sulfanilamide: Experimental and Clinical Study. J. A. Dingwall III.—p. 323.
Osteochondritis Dissecans. G. H. Stein, R. G. Ikins and F. C. Lowry.—p. 328.
Pilonidal Cyst: Postoperative Problem. L. A. Barnett.—p. 338.
Carcinoma of Rectum: Conservative Surgery in Certain Instances. D. R. Keller.—p. 346.
Cationic Detergents as Antiseptics. E. D. W. Hauser and W. W. Cutter.—p. 352.
*New Coagulum Contact Method of Skin Grafting: Further Simplifications in Technic. Macheteld E. Sano.—p. 359.
Burn Therapy: Consideration of Burns in Industry. Alma Dea Morani.—p. 361.
Method of Treating Nerve Ends in Amputation Stumps. J. T. Bate.—p. 373.
Treatment of Fractured Femur in Children. L. F. Bush.—p. 375.
Castilian Malva. M. Marks.—p. 379.
*Essential Hypertension: Surgical Treatment. W. P. E. Berwald and K. D. Devine.—p. 382.
Simultaneous Performance of Rubin Test and Endometrial Biopsy. S. S. Rosenfeld.—p. 385.

Coagulum Contact Method of Skin Grafting.—Sano had suggested the use of heparinized autogenous plasma and cell extract from the buffy coat alone or from the buffy coat admixed with erythrocytes as a means of promoting the immediate fixation of the graft and subsequent union by stimulation of cellular growth. When grafts are applied after heparinized autogenous plasma has been painted on the recipient area and cellular extract on the undersurface of the graft, a coagulum forms within a few minutes which fastens the graft in place, rendering unnecessary either sutures or special retention dressings. As a rule, vascularization of the graft follows within forty-eight hours. Thin, medium and thick split grafts as well

as full thickness grafts may all be used successfully with the method. Originally the author prepared the plasma and cell extract immediately before grafting. A modification of the original method consists in using pooled, heparinized dried plasma and dried cell extract instead of fresh autogenous plasma and cell extract in experimental skin grafting in guinea pigs. This method has all the advantages of the previously described method plus the convenience of having the plasma and cell extract immediately available for use anywhere at any time.

Surgical Treatment of Essential Hypertension.—In the past three years Berwald and Devine have employed extensive sympathectomy in the treatment of 29 patients with essential hypertension. In 24 of these Adson's subdiaphragmatic approach was used, 4 were operated on using Smithwick's dorsolumbar approach, and the remaining patient had the Smithwick operation on the right side and the Adson operation on the left side. Kidney biopsies were taken from 14 patients. All but 2 patients are alive. A careful follow-up was made on the surviving patients. The surgeon realizes that except in the most ideal cases he cannot cure hypertension, but he can effect partial cure, temporary alleviation and great subjective improvement in a large percentage of properly selected cases. The authors are enthusiastic about their results. Most of the patients were referred by clinicians who had exhausted the medical armamentarium in attempting to relieve them. Objective improvement was secured by sympathectomy in 64 per cent and subjective improvement in over 92 per cent of these cases. Sympathectomy, therefore, appears to have a real value and is here to stay until a better method is discovered. The criticism that the operation is too dangerous and strenuous for the patient compared to the relief obtained is not true. Few operations are attended with as little risk and postoperative discomfort as extensive sympathectomy.

American Journal of Tropical Medicine, Baltimore

24:157-220 (May) 1944

- Age Level for Peak of Acquired Immunity to Malaria as Reflected by Labor Forces. H. C. Clark.—p. 159.
- Quinine Inhibition of Bacterial Luminescence. F. H. Johnson and L. Schneyer.—p. 163.
- Cysticidal Effects of Chlorine and Ozone on Cysts of *Endamoeba histolytica*, Together with Comparative Study of Several Encystment Media. J. F. Kessel, D. K. Allison, Martha Kaime, Maria Quirós and A. Gloeckner.—p. 177.
- Amebiasis of Uterus. D. de Rivas.—p. 185.
- Influence of Cholesterol and Certain Vitamins on Growth of *Endamoeba histolytica* with a Single Species of Bacteria. C. W. Rees, J. Bozicevich, Lucy V. Reardon and F. S. Daft.—p. 189.
- *Incidence and Significance of *Trichomonas vaginalis* Infestation in Male. L. G. Feo.—p. 195.
- Intradermal Reactions Following Use of *Dirofilaria immitis* Antigen in Persons Infected with *Onchocerca volvulus*. W. H. Wright and J. R. Murdock.—p. 199.
- Intradermal and Serologic Tests with *Dirofilaria immitis* Antigen in Cases of Human Filariasis. J. Bozicevich and A. M. Hutter.—p. 203.
- Report on Program for Improving Teaching of Tropical Medicine in Medical Curriculum. H. E. Meloney.—p. 209.
- Financial Support of Tropical Medicine. A. R. Crawford.—p. 213.

Trichomonas Infection in Men.—According to Feo, accurate statistics are not available as to the frequency of *Trichomonas vaginalis* infection in men, but it is the opinion of many that the incidence of infection is higher than the literature would lead one to believe. The opportunity to examine a large series of men who had the provisional diagnosis of urethral discharge was afforded the author while assigned to the genitourinary section of the station hospital at Fort George G. Meade, Maryland. His studies were made on inductees found to have a urethral discharge or suspected of having one. Their ages varied from 18 to 43 years, with the mean falling between 20 and 30 years. The men were examined on arising in the morning before attending the latrine. The urethra was "stripped" and the resulting discharge collected on a cotton swab previously moistened with isotonic solution of sodium chloride. This was then mixed in 2 or 3 cc. of isotonic solution of sodium chloride. The organisms were sought by the microscopic examination of the moist films. This study revealed 144 of 926 men positive for *Trichomonas vaginalis*, a percentage incidence of 15.5. Separating this group into white and Negro men, the percentage incidence was 12 and 16.5 respectively. Of the 926 men examined, 246 were classed as having nonspecific urethritis.

The percentage incidence of nonspecific urethritis cases which may be attributable to *Trichomonas vaginalis* was 36.9. The entire group of *Trichomonas vaginalis* positive men was relatively free from all symptoms. A discharge may be noted which is characteristically small in amount, thin in consistency and of a dirty white color. Microscopically this discharge showed few epithelial cells and a moderate number of pus cells and trichomonads. Some of the stained smears were similar to vaginal ones from cases of *Trichomonas vaginalis* vaginitis as to number of trichomonads and types of bacteria. The male is the important transmitter of *Trichomonas vaginalis* infection, while the female eventually becomes a reservoir of infection.

Annals of Internal Medicine, Lancaster, Pa.

20:881-1046 (June) 1944

- The Internist at War: Glance at the Record. H. J. Morgan.—p. 881.
- Observations of Atypical Pneumonias of Influenzal Virus Type. E. A. Brethauer Jr. and R. T. Thompson.—p. 884.
- Primary Atypical Pneumonia, Etiology Unknown: Average Clinical Picture Based on 37 Original Cases. R. H. Smith.—p. 890.
- *Causes of Death in 30 Cases of Rheumatoid Arthritis. E. F. Rosenberg, A. H. Baggenstoss and P. S. Hench.—p. 903.
- Bacteroides Infections of Central Nervous System. W. E. Smith, R. E. McCall and T. J. Blake.—p. 920.
- Gallbladder Disease in Elderly Patients. J. Rosenthal.—p. 933.
- Pancreatic Lithiasis. T. C. Jaleski.—p. 940.
- *Nutritional Role of Cholesterol in Human Coronary Arteriosclerosis. C. F. Shaffer.—p. 948.
- Electrocardiographic Studies in Old Age. L. M. Taran and M. Kaye.—p. 954.
- Aneurysm of Aorta Rupturing into Right Ventricle. W. H. Harris Jr. and H. J. Schlattenberg.—p. 961.
- Source of Sulfathiazole Hematuria Induced in Rabbits. G. I. Trevett and S. S. Blackman Jr.—p. 971.

Causes of Death in Rheumatoid Arthritis.—Rosenberg and his co-workers reviewed data on cases of rheumatoid arthritis in which necropsies were done at the Mayo Clinic. Their aim was to establish the manner in which death occurred. The series comprises 30 cases. The 30 deaths in this series are listed under three headings: (1) those which seemingly resulted from the rheumatoid arthritis itself (10 cases), (2) those which were related to treatment of the arthritis (8 cases) and (3) those from causes unrelated to the arthritis or its treatment (12 cases). An unexpectedly high incidence of rheumatic heart disease was discovered. This condition was present in 16 of the 30 patients. It was often serious and was responsible for the deaths of 7 patients. In the other 9 of the 16 cases in which rheumatic heart disease was present it was not responsible for death. Pulmonary diseases were the most common causes of death in this series. These were of varying character including pneumonia, chronic suppurative, pulmonary embolism, fat embolism and massive collapse. Renal lesions were responsible for 3 deaths. Acute pyelonephritis with oliguria was present in 2 cases and fatal amyloid degeneration in 1. Prolonged diarrhea of an unknown origin was responsible for 2 of the deaths. In 5 of the 30 cases death resulted from miscellaneous causes. These included cinchophen hepatitis, carcinoma and violence. In 2 cases the exact manner of death was unknown.

Cholesterol in Coronary Arteriosclerosis.—Observations on experimental animals indicated that hypercholesteremia of nutritional origin is a factor in the development of atherosclerosis. Shaffer attempted to determine the effect of the nutritional factor in persons without manifest endocrine disturbances on the incidence of coronary arteriosclerosis as diagnosed by clinical methods. Records of over 1,000 patients with duodenal ulcer were reviewed, and 100 patients were selected for study. The 100 patients were in the age period of 45 to 65; 95 of these were men. All of them had been under treatment for an ulcer for not less than five years. The majority had been treated intermittently and periodically for ten to fifteen years. Treatment consisted of the use of milk and cream and antacids, no patient being selected for study who had not relied on the use of milk and cream for the relief of discomfort. It was considered that prolonged intermittent use of milk implied an abnormal increase in cholesterol in the diet and met the requirement of a nutritional factor. Five hundred patients were used as a control. These were also consecutively selected from hospital admissions and were in the same age period, 45 to 65, with the same sex ratio, 475 males and 25 females. None had received peptic ulcer treatment or had any manifest endocrine

disturbance. The incidence of coronary arteriosclerosis was identical in the two groups. The author concludes that the nutritional role of cholesterol in the genesis of human atherosclerosis is of doubtful significance unless there is an associated endocrinopathy.

Archives of Ophthalmology, Chicago

31:367-452 (May) 1944

- Intracapsular Cataract Extraction: Statistical Survey of 500 Consecutive Cases. F. A. Davis.—p. 367.
- *Changes in Fundus of Eye in Various Forms of Arterial Hypertension. H. Elwyn.—p. 376.
- Nervous Factor in Origin of Simple Glaucoma. O. Lowenstein and M. J. Schoenberg.—p. 384.
- Pupillary Reactions of Seemingly Unaffected Eye in Clinically Unilateral Simple Glaucoma: Pupillographic Contributions to Diagnosis of Glaucoma in Preclinical Stage. O. Lowenstein and M. J. Schoenberg.—p. 392.
- Causes of Impaired Vision in Recently Inducted Soldiers. F. H. Theodore, R. M. Johnson, N. E. Miles and W. H. Bonser.—p. 399.
- Conjunctivitis and Keratitis of Allergic Origin: Analysis of 54 Cases. W. O. Linhart.—p. 403.
- Cornea: VI. Permeability Characteristics of Excised Cornea. D. G. Cogan, E. O. Hirsch and V. E. Kinsey.—p. 408.
- Experimental Studies of Ocular Tuberculosis: VIII. Study of Increased Resistance to Reinoculation After Recovery from Ocular Tuberculosis Shown by Immune-Allergic Rabbit. A. C. Woods and E. L. Burkly.—p. 413.
- Leptotrichosis Conjunctivae: A Further Report. S. R. Gifford and A. A. Day.—p. 423.
- *Fundus Oculi in Urologic Diseases Associated with Systemic Hypertension. M. Cohen.—p. 427.

Changes in Fundus of Eye in Arterial Hypertension.—

Elwyn lists the changes in the fundus of the eye that may be observed during hypertension and says that the pathologic basis of these changes may be described as follows: (1) for the edema, transudation of fluid from the capillaries into the substance of the retina; (2) for the cotton wool patches, accumulations of precipitated fibrin and serum; (3) for the hemorrhages, the presence of blood in the various layers of the retina, especially in the inner layers; (4) for the sharply defined white spots, deposits of hyalin, mixed with lipids and with lipid-containing fat granule cells in the deeper layers of the retina, and for some of the more superficial white spots, a gangliiform swelling of segments of nerve fibers in the nerve fiber layer; (5) for the glistening white spots, deposits of lipid and lipid-containing fat granule cells, and for the star shaped figure in the macular area deposits of hyalin and lipids along the fibers of the layer of Henle, which radiate from the macula. The changes in the retinal vessels are either functional, resulting in contraction of the arteries, or organic. The organic changes are due to either aging of the vessels or to arteriosclerosis. Only some cases of hypertension show all of the enumerated changes; in others some of them are present, and, again, in other cases perhaps none at all. In uncomplicated essential hypertension in its benign form the retinal arteries are not contracted. The changes in the fundus of the eye are only those of aging and sclerosis of the retinal vessels. In the later stages occur complications, such as a few hemorrhages, occasionally a few white spots and occlusion of branches of the central vein and artery, occasionally of the main vessels as well. A more important complication is temporary arteriospastic retinitis as part of a temporary arterial contraction in many organs. In malignant renal sclerosis or the malignant phase of hypertension all the signs of arteriospastic retinitis are apparent, that is, narrowed arteries, edema, cotton wool patches, hemorrhages, hyaline and lipid deposits and the star shaped figure in the macular area. Edema of the optic disks is also present. Because the malignant stage of essential hypertension is preceded by a long period of high blood pressure, aging and sclerosis of the retinal vessels are also seen, with angular tortuosity of the vessels, irregularity of the lumen and apparent arteriovenous compression. The sub-endothelial hyalinosis is also observed in some of the arteries of the retina and gives the vessels their white, "silver wire" appearance. In hypertension associated with eclampsia the changes in the fundus of the eye indicate the severity of the arterial contraction. As a guide to the advisability of artificial termination of the pregnancy the ocular changes are of less importance than the continuous observation of the state of the blood pressure. The arteriospastic retinitis produced in the presence of adrenal or pituitary tumors may resemble that of malignant renal sclerosis.

Fundus Oculi in Urologic Diseases with Hypertension.—Cohen presents a case of pyelonephritis in which examination of the fundus resulted in the diagnosis of neuroretinopathy. Nephrectomy and absolute rest of seven months had no beneficial effect on the secondary hypertension. The increased lesions in the fundus and the impairment of renal function indicated progression of the underlying disease. Sympathectomy improved the renal function and reduced the hypertension as well as the edema of the disk. The author also presents a case of hydronephrosis and a case of polycystic kidney. In both cases he describes and illustrates the fundus changes. The patient with hydronephrosis like the one with pyelonephritis had a neuroretinopathy of inflammatory origin, while in the case of polycystic kidney the diagnosis was bilateral chorioretinal arteriosclerosis of noninflammatory origin. The author concludes that urologic diseases, accompanied by persistent high blood pressure, usually lead to lesions of the fundus. The changes in the fundus are indicative of the severity of the underlying hypertensive vascular disease. A report on the examination of the fundus should accompany the records of cases of urologic diseases with persistent hypertension, as it is an additional aid to the diagnosis and prognosis of the disease.

Arizona Medicine, Phoenix

1:101-164 (May-June) 1944

- Medicine on the March. D. L. Mahoney.—p. 117.
- Air Evacuation. P. Holbrook.—p. 119.
- Modern Attitudes in Hemolytic Anemia. G. Carpenter.—p. 121.
- History and Causes of Silicosis. J. W. Flinn.—p. 125.
- "Nurses and the War." Frieda Braun Erhardt.—p. 127.

Cancer Research, Baltimore

4:337-400 (June) 1944

- Studies in Cancer: VIII. Stilbestrol and Certain Steroids in Relation to Tumor Growth Resistance. J. W. Howard, L. T. Janzen and W. T. Salter.—p. 337.
- Id.: X. Oxidative Capacity of Tumors. Nelicia Mayer.—p. 345.
- Atypical Cell Proliferation in Anterior Lobe Adenomas of Estradiol Treated Rats. H. Selye.—p. 349.
- *Heterologous Transplantation of Human Cancers. H. S. N. Greene and P. K. Lund.—p. 352.
- Immunity Reactions Obtained with Transmissible Fowl Tumor (Olson). B. R. Burmester and C. O. Prickett.—p. 364.
- *Effect of Aromatic Compounds on Ascorbic Acid Content of Liver in Mice. E. L. Kennaway, N. M. Kennaway and F. L. Warren.—p. 367.
- On Role of Thymus, Spleen and Gonads in Development of Leukemia in High Leukemia Stock of Mice. D. P. McEndy, M. C. Boon and J. Furth.—p. 377.
- Effect of Adrenalectomy on Susceptibility of Rats to Transplantable Leukemia. E. Sturm and J. B. Murphy.—p. 384.

Heterologous Transplantation of Human Cancers.—Greene and Lund direct attention to the capacity of some human tumors to survive and to grow in the anterior chambers of the eyes of animals. The failure of later attempts to transplant benign tumors in this manner suggested that heterotransplantability might be a characteristic property of cancer. Accordingly a series of experiments was instituted in an attempt to investigate this suggestion and, although the results to date are confirmatory, the group of benign tumors tested is not yet sufficiently inclusive to allow generalization. However, a fairly comprehensive group of cancers has been successfully transplanted. Since previous experience had shown the superiority of the guinea pig over the rabbit as a host for human tissue, this species was used exclusively in the present series of experiments. A series of 10 human cancers, including a fibrosarcoma of the chest wall, an adenocarcinoma of salivary gland tissue, a chondromyxosarcoma of the larynx, a malignant melanoma, an epidermoid carcinoma of the buccal mucosa, an adenocarcinoma of the urethra, a mammary fibrosarcoma, an undifferentiated carcinoma of the lung, an epidermoid carcinoma of the lung and a chordoma have been successfully transferred to the anterior chamber of the eyes of guinea pigs. The transplants grow progressively in the alien host and bear a close histologic resemblance to the original tumors. The authors suggest that the ability to grow cancer in lower animals affords an approach to many other problems associated with human tumors. After successful primary transplantation the cancer can be carried by serial passage to new generations of animals and subjected to a variety of investigations not permissible during residence in the human host. After preliminary growth in the anterior chamber, transfer to other body regions is readily effected.

Gastroenterology, Baltimore

2:307-384 (May) 1944

Volvulus and Incarceration of Stomach in Diaphragmatic Hernia with Complete Acute Gastric Obstruction: Operative Recovery with Obliteration of Hernial Sac by Tamponade. M. G. Vorhaus and DeW. Stetten.—p. 307.

Gastroscopic Picture of Hypertrophic and Atrophic Gastritis. R. Schindler.—p. 316.

*Level of Vitamin B Complex in Diet at Which Detectable Symptoms of Deficiency Occur in Man. E. E. Foltz, C. J. Barborka and A. C. Ivy.—p. 323.

Duodenal Ulcer Developing in Man Following "Histamine Desensitization." G. McHardy and D. C. Browne.—p. 345.

*Further Studies on Effect of Sodium Alkyl Sulfate on Peptic Activity. J. B. Kirsner and E. H. Spitzer.—p. 348.

Excretion of Ingested Succinylsulfathiazole in Material Drained from Human Biliary Tract. A. H. Aaron and R. S. Hubbard.—p. 354.

Level of Vitamin B Complex in Diet Deficiency Level.

—Foltz and his associates present data which indicate the level of thiamine and riboflavin, especially the former, in the diet at which evidence of deficiency was detectable by a decrease in work output and the manifestation of subjective symptoms. Four subjects residing in a hospital and receiving a diet containing measured quantities of thiamine and riboflavin were trained during a period of from nine to twelve months on a bicycle ergometer, their work output during a double work period of rapidly exhausting work being recorded. During this control and training period the daily diet contained 0.43 to 0.59 mg. of thiamine per thousand calories of food, or a total daily average intake of thiamine of 1.44 mg. The urinary excretion of thiamine and riboflavin and the thiamine blood level was measured; in addition the blood pyruvic acid values were determined between seven and eight minutes after the conclusion of the last work period. The subjective complaints of the subjects were recorded as well as leg muscle tenderness and pain. A decrease in appetite occurred within three weeks in all subjects when the thiamine intake was reduced to from 0.33 to 0.38 mg. per thousand calories. A decided decrease in appetite and work output and increase in muscle tenderness and pain and desire for sleep, or fatigue, and a deterioration in mental attitude, nervous stability and alertness did not occur until four weeks after the thiamine intake had been reduced to from 0.17 to 0.21 mg. per thousand calories. The daily thiamine excretion in the urine ranged from 5 to 20 micrograms, but the riboflavin excretion except for a brief period in 1 subject did not fall below 200 micrograms. The signs and symptoms of deficiency disappeared promptly after the addition of a yeast concentrate to the diet which yielded a total daily intake of 15.5 mg. of thiamine and 6.15 mg. of riboflavin. The blood pyruvic acid values remained relatively constant and yielded no unequivocal information. In confirmation of the observations of others, the authors conclude that a daily dietary intake of approximately 0.20 mg. per thousand calories of thiamine (a total daily intake of about 0.6 mg.) results in signs and symptoms of a dietary deficiency within eight weeks. They think that the minimum daily requirement of thiamine of young men ranges from 0.33 to 0.45 mg. per thousand calories.

Effect of Sodium Alkyl Sulfate on Peptic Activity.

Kirsner and Spitzer present additional data concerning the action in vitro of sodium alkyl sulfate on the peptic activity of human gastric juice and of a standard pepsin solution. Peptic activity and p_n were determined by methods previously indicated. The standard pepsin solution was prepared by transferring 625 mg. of granula pepsin (Pfannstiel) to a 500 cc. volumetric flask and dissolving in 1/20 molar hydrochloric acid. The solution was then diluted to volume with 1/20 molar hydrochloric acid. The results are expressed in terms of the degree of inhibition of peptic activity as compared with the control values and are recorded in tables. On the basis of their observations the authors arrive at the following conclusions: 1. Sodium alkyl sulfate greatly inhibits in vitro the peptic activity of human gastric juice and of a standard pepsin solution. 2. Optimum inhibition of the peptic activity of a standard pepsin solution at p_n 1.70 is obtained with about two and one-half minutes' incubation at a temperature of approximately 30 to 38 C. 3. The inhibition of peptic activity by sodium alkyl sulfate is apparently an irreversible effect. 4. Lactic acid in

0.2 cc. quantities exerts a slight protective action against the inhibiting effect of sodium alkyl sulfate. Similar amounts of formic, caprylic and acetic acids are ineffective in this respect. 5. Triacetin ethyl butyrate, ethyl caprylate, ethyl laurate, ethyl myristate and sodium taurocholate in 0.1 cc. quantities exert a moderate protective action against the inhibiting effect of sodium alkyl sulfate.

Journal of Allergy, St. Louis

15:163-244 (May) 1944

Studies in Hypersensitiveness of Mucous Membrane: V. Comparative Studies of Skin and Ophthalmic Reactions in Hay Fever Patients Presenting Constitutional Reactions. H. Sherman and Bessie Baron.—p. 163.

Arthus Type of Sensitivity to Liver Extract. S. E. Rynes and L. M. Tocantins.—p. 173.

Causes of Hay Fever Occurring between Grass and Ragweed Seasons. R. Chobot and H. D. Dundy.—p. 182.

Contact Dermatitis Resulting from Manufacture of Synthetic Resins and Methods of Control. S. D. Lockey.—p. 188.

Disposition of Soldiers with Bronchial Asthma. R. I. Alford.—p. 196.

Consideration of Some Allergy Problems: I. Allergic Dermatitis (Eczema). R. A. Cooke.—p. 203.

Id. II. Serologic Studies of Skin Reacting Allergies (Hay Fever Type). R. A. Cooke.—p. 212.

Volumetric Incidence of Atmospheric Allergens: II. Simultaneous Measurements by Volumetric and Gravity Slide Methods; Results with Ragweed Pollen and Alternaria Spores. O. C. Durham.—p. 226.

Clinical Evaluation of Ascorbic Acid in Treatment of Hay Fever. S. Hebal.—p. 236.

Journal of Lab. and Clinical Medicine, St. Louis

29:561-672 (June) 1944

Acute and Chronic Toxicity of Isopropyl Alcohol. A. J. Lehman and H. F. Chase.—p. 561.

Treatment of Pneumococcal Pneumonia with Sulfamethazine: Preliminary Report. E. H. Loughlin, R. H. Bennett and Mary E. Flanagan.—p. 568.

Pathologic Changes Produced by Prolonged Administration of Sulfapyrazine and Sulfamethyldiazine (Sulfamerazine) in Kidneys of Rabbits as Compared with Sulfathiazole and Sulfadiazine. F. T. Callomon, with technical assistance of Loraine Groskin Linton.—p. 574.

Diagnosis and Treatment of Epidemic Cerebrospinal Meningitis. J. L. Bohan and F. B. Lusk.—p. 585.

Association of Acute Interstitial Pancreatitis with Acute Pneumococcal Mural Endocarditis. A. Trasoff and D. R. Meranze.—p. 590.

Nodal Rhythm and Bundle Branch Block Following Aspirin Hypersensitivity. N. Bloom and H. Walker.—p. 595.

Transient T Wave Inversion Following Paroxysmal Tachycardia. S. L. Zimmerman.—p. 598.

*Cotton Hose as Vehicle for Fungicide in Treatment of Athlete's Foot. Phoebe J. Crittenden and Luella S. Joiner.—p. 606.

Effect of Heat Produced by Short Wave Diathermy on Activity of Muscle. W. W. Tuttle and Lucille Fitts.—p. 609.

Effect of Artificially Induced Fever on Anaphylactic Shock in Actively Sensitized Guinea Pigs. R. Y. Gottschall, P. deKruif, H. E. Cope and D. Laurent, in collaboration with W. M. Simpson, H. W. Kendell and D. L. Rose.—p. 614.

Clumping of Erythrocytes in Hayem's Diluting Fluid: Grave Prognostic Sign. E. D. Angelis and Mildred Huntsinger.—p. 624.

Reactions in Blood and Organs of Dogs on Intravenous Injection of Solution of Hemoglobin. W. C. Hueper.—p. 628.

Assay of Renin Substrate by Low Temperature Incubation with Renin. L. A. Sapirstein, Rachael K. Reed and F. D. Southard Jr.—p. 633.

Cotton Hose Impregnated with Fungicide in Treatment of Ringworm.—The good results in the treatment of fungous infections of the hands and feet with copper sulfate driven into the skin by iontophoresis gave Crittenden and Joiner the idea of impregnating cotton hose with a fungicide for use in the treatment of ringworm not only because hose are in close contact with the foot during waking hours but also because treated hose bring the fungicide in contact with the shoe lining, which frequently is a source of reinfection. The experimental work was begun using solution of copper sulfate for impregnating the cotton hose. Later copper acetate was substituted for copper sulfate in cases not responding satisfactorily. Clean dry cotton socks of good grade were soaked for thirty minutes in the solution of copper salts at 40 C. After drying, the hose were ready for wear. The subjects cooperating in the study were 17 men and 1 woman, each of whom was afflicted with ringworm. They wore cotton hose impregnated with copper sulfate or acetate for periods of from one and one-half to ten months. The skin of 6 appeared normal, 11 showed improvement and 1 was worse at the end of the experiment. The acetate seemed to be more beneficial than the sulfate.

New England Journal of Medicine, Boston

230:595-624 (May 18) 1944

History of Discovery and Isolation of Female Sex Hormones. G. J. Newerla.—p. 595.

Sweat as Culture Medium for Fungi. T. Cornbleet and Esther Meyer.—p. 604.

Gynecology: Carcinoma of Cervix. J. V. Meigs.—p. 607.

230:625-656 (May 25) 1944

Surgical Treatment of Esophageal Atresia and Tracheoesophageal Fistulas. W. E. Ladd.—p. 626.

*Hereditary Hemorrhagic Telangiectasia: Analysis of Capillary Heredopathies. K. Singer and W. Q. Wolfson.—p. 637.

Endoscopy. E. B. Benedict.—p. 642.

Hereditary Hemorrhagic Telangiectasia.—Singer and Wolfson report a family in which typical lesions of hereditary hemorrhagic telangiectasia were present together with a positive tourniquet test. The first patient was a woman aged 80 who came under observation because of repeated spontaneous epistaxis for a period of forty years. Investigation revealed a strong hereditary tendency to telangiectasia. The woman's father had had telangiectasia and epistaxis. Reports are available on 66 members of the family, 16 of whom present telangiectasia. Telangiectasia was present in the first generation in one line but not in the second or third, and it reappeared in the fourth generation. A diagram of the family tree shows that the 2 cases described by the authors concerned nieces of the woman mentioned in the first case report. In comparing case 2 with case 1 it was noted that the tendency to bleed from the telangiectases and the tendency to easy bruising were more severe in the former. Epistaxis was more severe and the tourniquet test was more strongly positive in the latter. In case 3 the tendency to easy bruising was even more prominent and the tourniquet test was the most strongly positive of the 3 cases. A positive tourniquet test in a syndrome in which a negative tourniquet test is ordinarily considered a diagnostic criterion is noteworthy. Although only 3 members of the family could be examined, the occurrence of the unusual combination of a positive tourniquet test with telangiectasia in all of them makes it likely that both abnormal capillary manifestations were present on a hereditary basis. Whether the association of a positive tourniquet test with hereditary telangiectasia is fortuitous or is indicative of a more fundamental capillary disturbance presents a problem that necessitates analysis of the clinical pathology of capillary hereditary diseases. An abnormal contractility response of a capillary to injury as expressed by a prolonged bleeding time and an abnormal capillary fragility to pressure, as seen by a positive tourniquet test, represent independent variables that may be singly or simultaneously involved. Pseudohemophilia is characterized by a prolonged bleeding time but a negative tourniquet test, and hereditary purpura simplex by a normal bleeding time but a positive tourniquet test. Combinations of the two types exist. Hereditary hemorrhagic telangiectasia is a localized gross abnormality of capillaries usually not accompanied by systemic capillary dysfunction. The family reported here represents such a combination of localized gross deviation of capillary structure and increased capillary fragility. The diagnosis of hereditary capillary syndromes should depend on physiologic analysis and not on rigidly demarcated types of disorders.

230:657-684 (June 1) 1944

*Thiouracil in Treatment of Thyrotoxicosis: Report of 72 Cases. R. H. Williams and H. M. Clute.—p. 657.

Favus in Massachusetts: Report of 2 Cases. G. E. Morris.—p. 667.

Endoscopy (concluded). E. B. Benedict.—p. 669.

Thiouracil in Treatment of Thyrotoxicosis.—Williams and Clute used thiouracil in the treatment of 72 patients with thyrotoxicosis. The 59 patients who had not had iodide therapy for one month or more were divided into three groups according to the basal metabolic rate. The decline in the basal rate was more rapid in the severe cases (basal metabolic rate $+55$ to $+89$ per cent) than in the others but required an average of five weeks to become normal, whereas in the moderately severe cases ($+35$ to $+55$ per cent) only four weeks was necessary and in the mild ones ($+15$ to $+35$ per cent) only three weeks. The lowering of the basal metabolic rate of patients who had taken iodide until the thiouracil treatment was started was slower.

All patients, however, regardless of the type of thyrotoxicity or of previous treatment, eventually attained a normal metabolic rate and a remission of the disorder. Thirty-five patients were treated with thiouracil for more than four months and 16 for more than six months. Patients maintained a normal basal metabolism, though in 4 who discontinued therapy a relapse occurred, but a remission was again obtained with thiouracil treatment. Although a transient increase in the size of the thyroid occurred in several cases, in the majority a decrease in size resulted. A few patients with malignant exophthalmos experienced an exacerbation in this process under thiouracil therapy, but with a decrease in the dosage of thiouracil and the use of desiccated thyroid an improvement resulted. One patient developed agranulocytosis; other complications consisted of a morbilliform rash, urticaria, allergic arthritis, edema of the legs, vomiting and enlargement of the submaxillary salivary glands. In the first 30 patients treated the initial daily dosage of thiouracil was usually 1 Gm., but with subsequent patients it was 0.6 Gm. daily or 0.4 Gm. In most cases, however, the dose was reduced to 0.2 Gm. daily over a period of about six weeks. Single doses usually consisted of 0.2 Gm., although they were sometimes only 0.1 Gm. When several doses were given daily they were spaced evenly. With the range of dosage employed, the drug has not been found to accumulate appreciably in the blood in spite of the presence of severe disease of the kidneys and liver. For reasons other than an unsatisfactory response in the toxic manifestations of the disease, 22 patients were subjected to thyroidectomy. The operative and postoperative course was relatively smooth, particularly in the patients treated with thiouracil for three weeks or longer preceding operation. A chemical analysis of these glands showed a great variation in the amount of drug present. There was no correlation of the therapeutic response with the level of the drug in the gland. The pathologic alterations in the thyroid gland resulting from thiouracil treatment are quite unlike the changes found after iodide therapy.

United States Naval Med. Bulletin, Washington, D. C.

42:1233-1476 (June) 1944. Partial Index

*Dengue: Analysis of Clinical Syndrome at South Pacific Advance Base. F. H. Stewart.—p. 1233.

Eosinophilia in South Pacific. H. C. Allen.—p. 1241.

Function of Medical Officer in Battle Zones. L. K. Ferguson.—p. 1269.

Concentrations of Sulfonamides in Wound Exudates Following Oral Administration: Experimental Study. W. W. Sager and R. H. Pudenz.—p. 1275.

*Advantages and Limitations of Intravenous Sodium Sulfathiazole. G. Milles.—p. 1283.

Laboratory and Field Studies of Glycols and Floor Oiling in Control of Air Borne Bacteria. A. P. Krueger and others.—p. 1288.

*Sprained Ankles. J. M. Wright, L. O. Parker and T. R. Lehan.—p. 1309.

Arthrotomy of Knee: Review of 50 Cases. E. M. Anderson.—p. 1314.

Myotomy in Repair of Divided Flexor Tendons. L. Blum.—p. 1317.

Reconstruction of External Ear: Conservation of Avulsed Portion. P. W. Greeley.—p. 1323.

Marsupialization of Pilonidal Cysts. R. J. Coffey.—p. 1326.

Pilonidal Cyst: Removal by Transverse Incision—Preliminary Report. F. H. Johnson and S. J. Gorham.—p. 1330.

Acute Appendicitis Afloat: Clinical Study. C. N. Cooper.—p. 1334.

Nonspecific Infective Granuloma of Appendix: Review of Literature, with Case Report. J. I. Anton and M. Weinstrobel.—p. 1337.

Lesions of Male Breast. H. Eichert.—p. 1350.

Postconcussion Syndrome: Pathogenesis and Prophylaxis. J. H. Siris.—p. 1357.

Corneal Graft or Tattooing with Iridectomy? With Brief Report on Corneal Studies After Electrocoagulation. A. A. Knapp.—p. 1366.

*Postvaccinal (Yellow Fever) Jaundice: Report of Fatal Case. J. A. deVeer and M. J. Matzner.—p. 1381.

Dengue at a South Pacific Advance Base.—Stewart says that over 25 per cent of the military population of an island contracted dengue. There were no deaths, but the disease caused 80,000 sick days. Mosquitoes of the Aedes group were found in abundance on the island. Frontal headache and pain in or behind the eyes and pain low in the back are characteristic early symptoms. Chilly sensations make the sufferer use a blanket on a hot day; the chill is a true teeth-chattering chill which lasts several minutes. There may be aches and pains in or about several joints and in the muscles of the legs, arms and neck. A chain of pea size lymph nodes is felt at the base of the neck over the posterior scalenus muscles. These nodes

are not tender, vary in size and are not found in the suboccipital region as is the case in German measles. The pulse is moderately rapid during the first day, but later it becomes slow and in spite of high fever there is bradycardia. The temperature curve and the discomfort run parallel, but the pulse remains slow. During the first day or two the fever is high, but often on about the third day the temperature falls to a normal level for from several hours to two days. During this lull the patient feels better. Usually on the fourth or fifth day the fever returns. This second spike of fever is often higher than the first. Recovery is by crisis. Other types of temperature curves occur, but regardless of the type of curve the fever will not last beyond seven days and more often is over by the fifth day. This is a disease of one week's duration. The various skin manifestations are classified as rash A and rash B. Dengue must be differentiated from infectious jaundice, German measles, scarlet fever, mononucleosis, malaria, bacillary dysentery, appendicitis, mumps, meningitis, influenza, virus pneumonia and catarrhal fever. Treatment of dengue is entirely symptomatic. Reassurance, rest in bed and sedatives are important. Acetylsalicylic acid seems to control the discomfort but has the disadvantage of causing excessive sweating. Phenobarbital $1\frac{1}{2}$ grains (0.1 Gm.) at bedtime is often not sufficient. Codeine $\frac{1}{2}$ grain (32 mg.) combined with acetylsalicylic acid is required in most cases. For several days after discharge there is a feeling of fatigue and inability to carry on usual duty. This rarely lasts longer than a week. Despondency and irritability are often accompanying symptoms but almost never last longer than two weeks. The incubation period is as short as five days. No proved recurrences have been observed in a period of six months.

Intravenous Sodium Sulfathiazole.—Milles points out that conjugation of sulfathiazole to the acetylated form occurs chiefly in the liver. Taken by mouth, the drug is absorbed into the portal circulation and passes through the liver in its entirety, exposing it to acetylation before it reaches the general circulation. Administered intravenously, little of the drug reaches the liver until it has traversed the peripheral circuit, thereby exposing the tissues to the peak concentration of the drug in its original form. The author reviews observations on patients treated intravenously with sodium sulfathiazole. The drug was administered by syringe in from 5 to 20 per cent solution; the maximum dose was 3 Gm. Local tissue irritation was not noted. The daily urinary output was measured and in those who were given the drug only intravenously was examined microscopically for blood and crystals on one or more occasions. In previous observations, levels of approximately 20 mg. per hundred cubic centimeters of blood were obtained immediately after the intravenous administration of 3 Gm. of sodium sulfathiazole, falling to less than 1 mg. at the end of twenty-four hours. Observations on 46 patients who received single or multiple doses of sulfathiazole intravenously, some of whom also received sulfonamides orally, are recorded in tables. Hematuria without crystalluria occurred in 1 instance, suggesting a direct toxic effect of the drug on the kidneys. Vomiting occurred during or shortly after the administration of the drug in 3 instances. It was very likely due to the speed with which the solution was injected. Headache occurred in 1 subject who had noted the same symptom when the drug was administered orally. One patient who displayed intolerance to the drug when administered orally, as indicated by fever and vomiting, tolerated the drug intravenously without the slightest reaction. Crystalluria was not noted in any instance. There were 15 in which the drug achieved good clinical results with a total dose smaller than would be expected to be effective orally. In 9 cases the drug achieved good clinical results when administered intravenously after sulfathiazole had apparently failed when given by mouth. The drug was ineffective in 5 cases, and there were 16 cases in which the results were equivocal. The author does not deprecate the use of sulfonamides orally or locally. He urges that in those diseases and injuries in which there is a time race with infection the drug should be used intravenously initially. As in all sulfonamide therapy, regardless of the route by which the drug is administered the fluid intake must be maintained; the urinary output must be measured and recorded; the blood picture must be studied if the drug is continued for more than forty-eight hours.

Sprained Ankles.—Wright and his associates say that if an injured ankle is x-rayed and no fracture or dislocation found, a diagnosis of sprain is usually made. They show that the pathologic changes in sprained ankles are of two types: (a) complete ligamentous rupture; (b) hematoma with slight ligamentous damage. The differential diagnosis can be made only by careful physical examination or by anteroposterior x-ray inspection during manipulation under anesthesia. The best treatment for complete ligamentous rupture is the application of a walking cast for at least six weeks. Reconstructive surgery may be required in chronic cases. The essential treatment for the simple sprained ankle without serious ligamentous injury is (a) early pressure bandage, (b) limitation of the hematoma and swelling by procaine injection with massage and early use, (c) contrast baths or intermittent traction and massage for persistent swelling and stiffness.

Postvaccinal (Yellow Fever) Jaundice.—An increased incidence of jaundice was observed by deVeer and Matzner at a naval hospital in the spring of 1942. Thirty patients with jaundice were studied within a period of two months. All but 1 recovered and, with this exception, presented a clinical picture indistinguishable from the commonly termed "acute catarrhal" or "infective jaundice" of unknown etiology. The patient who died was a seaman aged 20 who was admitted to the hospital with the complaint of anorexia, vomiting, jaundice, malaise and abdominal discomfort. His past history was irrelevant. About four months prior to the onset of illness he had been immunized with yellow fever vaccine. He appeared to improve during the first few days of hospitalization under a regimen similar to that employed for other icteric patients, but then suddenly, without warning, he became very drowsy and unresponsive to questioning. The jaundice rapidly increased, the icterus index rising to 250. There was no further response to treatment, and the patient's condition became progressively more grave until he died on the eighteenth day of hospitalization (the twenty-sixth day of illness). The necropsy revealed an acute yellow atrophy of the liver in a stage at which both advanced necrosis and regeneration were present, a picture apparently identical in type with that reported in the recent outbreak of jaundice in the Army. The authors review the probable relationship of jaundice to yellow fever immunization by vaccine containing human serum. The risk of postvaccinal (yellow fever) jaundice appears to have been removed by the elimination of the human serum component formerly employed in the preparation of yellow fever vaccine. In the event of future outbreak of jaundice, it is recommended that any possible relationship to the administration of yellow fever vaccine, whole blood, plasma or related biologic products be investigated in the hope of discovering the presence of some as yet unrecognizable iatrogenic agent.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

52:245-286 (June) 1944

- Formation of Artificial Vagina: Experiences with Three Different Corrective Procedures. H. K. Marshall.—p. 245.
Final Domicile of Appendicular Stump Following Invagination with Purse String Suture. W. M. Hayes.—p. 256.
Madura Foot or Mycetoma: Report of 2 Cases. A. Gottlieb.—p. 264.
Accelerated Postpartum Involution of Uterus with Vitamin B Complex Therapy. L. H. Biskind and M. S. Biskind.—p. 266.
Use of Sodium Pentothal and Local Anesthesia in Cesarean Section. R. D. Dunn.—p. 271.
Factors Influencing Lactation. J. C. Brougher.—p. 274.
Emergency Maternity and Infant Care Program: Administration in State of Oregon. J. F. Belz.—p. 278.

West Virginia Medical Journal, Charleston

40:169-208 (June) 1944

- Shotgun Wounds of Abdomen. W. M. Warman.—p. 169.
Direct Blood Transfusion in Modern Surgical Practice. C. D. Hershey.—p. 173.
Ambulatory Treatment for Sprained Ankles. J. T. Welher.—p. 176.
Deafness. F. V. Gammage.—p. 179.

40:209-244 (July) 1944

- "Beyond the Blue Horizon." R. J. Reed Jr.—p. 209.
Newer Trends in Management of Upper Respiratory Tract Infections. A. R. Hollender.—p. 215.
Growing Children—Our Responsibility. A. E. Amick.—p. 223.
Doctor-Hospital Partnership in Public Relations. C. F. Runyon and R. J. Wilkinson Jr.—p. 233.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:643-676 (May 13) 1944

National Health Service. Report of Council of B. M. A.—p. 643.

Head Injuries Involving Air Sinuses. D. McKenzie.—p. 652.

*Use of Crude Penicillium Filtrate for Local Treatment. J. M. Alston.—p. 654.

Autolysed Yeast in Treatment of Nutritional Macrocytic Anemia. G. R. Sippe.—p. 656.

Famine Edema in Prisoners of War. D. S. Stevenson.—p. 658.

1:677-708 (May 20) 1944

Course of Death Rate from Peptic Ulcer in Great Britain, 1912-1938. H. Tidy.—p. 677.

Treatment of Gas Gangrene. J. D. MacLennan and M. G. MacFarlane.—p. 683.

Fracture of Carpal Scaphoid. J. M. Robertson and R. D. Wilkins.—p. 685.

Epidemic Infective Hepatitis in Gloucestershire. J. A. Cookson.—p. 687. Experiments on Scabies Prophylaxis. K. Mellanby.—p. 689.

Crude Penicillium Filtrate for Local Treatment.—

Alston reports results with local use of untreated filtrate of penicillium in 24 patients. The medium in which Penicillium notatum was grown contained 3 Gm. of sodium nitrate, 0.5 Gm. of potassium chloride, 0.5 Gm. of magnesium sulfate, 0.01 Gm. of ferrous sulfate, 6.5 Gm. of potassium dihydrogen phosphate, 33.5 Gm. of disodium hydrogen phosphate, 40 Gm. of glucose and distilled water to 1,000 Gm. This is sterilized in free steam for one and one-half hours in 200 cc. amounts in 1 liter conical flasks; 5 cc. of a 10 per cent solution of sterile calcium carbonate is added to every 200 cc. of medium before inoculating. The medium should form a depth of not more than 1.5 to 2 cm. in order to expose to air a large surface relative to the volume. Incubation is at a temperature of 24 C. for eight to ten days. The mold forms a thick firm pellicle, and the culture medium below is clear. The fluid medium, after growth, is passed through a Seitz filter and is tested to make sure that the reaction is nearly neutral and that less than 0.1 per cent glucose is left. The filtrate is applied to superficial lesions by gauze soaked in it, by a cream or by portions of the recently grown mold after the fluid medium had been drained away from it. Cavities in bone which are accessible to the surface are packed lightly with gauze soaked in the filtrate and sealed. Deep sinuses in muscle and subcutaneous tissues are treated with indwelling catheters, which are carefully shortened as the sinuses heal from the bottom. Cavities and sinuses are washed out with saline solution before fresh filtrate is left in them. In 19 of the 24 patients treated the filtrate has been successful; in the other 5 success was partial, doubtful or absent. The author concludes that crude penicillium filtrate containing 4 to 10 units of penicillin per cubic centimeter may be used successfully for treating many acute and chronic inflammations by local application.

1:709-738 (May 27) 1944

With the Eighth Army in the Field. C. Donald.—p. 709.

Sensitivity to Liver Extract. J. G. McSorley and L. S. P. Davidson.—p. 714.

Experimental Traumatic Shock. J. Charnley.—p. 716.

*Dicoumarin in Treatment of Puerperal Thrombosis. A. Davis and Margaret Porter.—p. 718.

*Effect of Nicotinic Acid on Postoperative Vomiting. W. W. Mushin and Helen M. Wood.—p. 719.

Dicoumarol in Treatment of Puerperal Thrombosis.—

Davis and Porter report results of an investigation into the possible value of the anticoagulant principle dicoumarol in obstetrics. In all, 43 cases of postpartum thrombosis were treated. They were of every degree of severity, from small saphenous lesions to bilateral femoral blockage. The cases varied so widely in severity that it was impossible to find an exact parallel series for purposes of control, but comparison with the same number of untreated cases showed a great improvement after dicoumarol. There were slight but definite amelioration of pain, a fairly rapid diminution of the edema and a shortened average stay in hospital—nineteen as against twenty-eight days. In addition the incidence of pulmonary embolism was lowered from 9 to 4 per cent, and in only 1 case was this of any degree of severity. The drug was well tolerated, and there were no untoward complications and no suggestion of spontaneous

hemorrhage. The authors conclude that dicoumarol is of value in the particular type of patient they investigated, and in these cases of established thrombosis it would appear to be fairly safe. The freedom from hemorrhagic complications may be due to the normal increase in the coagulability of the blood during the puerperium.

Nicotinic Acid in Postoperative Vomiting.—Mushin and Wood studied the effect of nicotinic acid on postoperative vomiting in two groups of patients. In one group it was given both preoperatively and postoperatively, and in the other as postoperative treatment alone. The doses were 50 mg. two-hourly. A control series was studied. In all three groups as many factors as possible were kept constant. No statistically significant effect on the incidence of postoperative vomiting was observed as a result of administering nicotinic acid.

Lancet, London

1:587-618 (May 6) 1944

State of Men Severely Wounded in Battle. W. C. Wilson.—p. 587.

*Sulfathiazole-Proflavine Powder in Wounds. J. McIntosh, F. R. Selbie, R. V. Hudson, T. Parkes, D. H. Patey, H. L. McMullen and G. C. L. Pile.—p. 591.

*Sulfathiazole-Proflavine Powder in War Wounds. G. Y. Feggetter.—p. 593.

Control of Sepsis in Hospital in North Africa, with Observations on Sulfathiazole-Proflavine Powder in Surgical Wounds. P. B. Ascroft.—p. 594.

Carcinoma of Prostate Treated with Stilbestrol. J. D. Fergusson.—p. 595.

Pentothal Anesthesia in Bronchoscopy. L. Fatti and H. J. V. Morton.—p. 597.

Delayed Rupture of Spleen. H. Bell and G. H. Steele.—p. 598.

Sulfathiazole-Proflavine Powder in Wounds.—According to McIntosh and his collaborators data from experiments, both in vitro and in vivo, indicate that the most effective antiseptic mixture now available for wound disinfection is a powder consisting of 1 part of proflavine and 99 parts of sulfathiazole. In addition to its powerful action on pyogenic cocci this mixture has a high grade of activity against Clostridium welchii, Clostridium oedematiens and Clostridium septicum, the three most frequent causal organisms of gas gangrene. The proflavine enhances the antistaphylococcus action of the sulfathiazole and at the same time affords protection against gram negative organisms. It has also the advantage of being active in serum. The value of the powder could be increased by addition of that ideal wound antiseptic penicillin. In contaminated wounds a thorough surgical toilet must be done before the powder is dusted over the surface of the wound, preferably by insufflating with a blower. The amount used should be just sufficient to give a slight coating on the surface—equivalent to 0.5 Gm. to 4 square inches. Good results have been obtained by treating on alternate days. Wounds usually become dry in four to five days, coinciding with the suppression of the infection. The part of this paper which reviews the clinical application of the sulfathiazole-proflavine powder presents comments on results obtained by Hudson and Parkes, by Patey and McMullen and by Pile. These reports demonstrate the preventive and curative action of the powder in wounds.

Sulfathiazole-Proflavine Powder in War Wounds.—

Feggetter describes the results of treating a variety of war wounds with sulfathiazole-proflavine powder. In fresh wounds thorough surgical treatment was carried out, the powder was insufflated and most wounds were sutured completely; some had a small drainage tube inserted into potential dead space for four to seven days. The sutured wounds healed by first intention. In the others a small area of granulation remained around the site of the drainage tube which healed within a week. Older wounds in patients who arrived without preliminary treatment, two to three days after wounding, were already infected and the surgical treatment here consisted of incision of skin, fascia and muscle, removal of foreign matter and insufflation of sulfathiazole-proflavine powder; the wounds were left open without sutures, and large wounds with or without fractures were encased in plaster. These wounds healed well. There were 8 patients with gas gangrene. Of 4 treated elsewhere 3 had amputation and died, and 1 recovered. The other 4 were treated by incision, excision of muscle and insufflation of sulfathiazole-proflavine powder; of these, 3 healed locally and 1 required amputation later for sepsis, the gas gangrene being controlled.

In 50 wounds treated elsewhere the indication for operation was spreading inflammation or persistent suppuration. Following enlarging of the entry wound, removal of foreign bodies and debris, and insufflation of sulfathiazole-proflavine powder, the wound was left open. In all 50 cases the spread of infection was arrested and the wounds quickly healed. In 7 amputations, in some of which the amputation site had to be approached through edematous or frankly purulent muscle, flaps were fashioned, sulfathiazole-proflavine powder was insufflated and wounds were loosely sutured with or without tube drainage; these wounds healed well. Four second degree burns of moderate extent have been treated with sulfathiazole-proflavine powder. There seemed to be much less local infection than in the cases treated with other powders and cream. Complete bacteriologic investigations could not be arranged during the treatment, but sulfathiazole-proflavine powder is certainly the best wound antiseptic that the author used. The local use of sulfathiazole-proflavine powder should enable many wounds to be sutured with safety.

1:619-648 (May 13) 1944

Reflection on Reform in Medical Education. T. Lewis.—p. 619.

Injuries to Main Bile Ducts. G. G. Turner.—p. 621.

*Homologous Serum Jaundice: Transmission Experiments with Human Volunteers. F. O. MacCallum and D. J. Bauer.—p. 622.

Marfanil and Marfanil Pronalbin. G. A. G. Mitchell, W. S. Rees and C. N. Robinson.—p. 627.

Two Cases of Leprosy in London. H. Haber.—p. 629.

Nomenclature of Malnutrition. L. Nicholis.—p. 630.

Pharmacology of Thiourea. D. Campbell, F. W. Landgrebe and T. N. Morgan.—p. 630.

Homologous Serum Jaundice.—MacCallum and Bauer describe attempts to isolate an icterogenic agent from cases of serum jaundice and from a known icterogenic serum obtained from a blood transfusion depot. Experiments were made on animals and on human volunteers. Although the number of subjects used in each group was small, the following tentative conclusions can be drawn: 1. Serum from a presumed case of homologous serum jaundice was icterogenic on the seventh day after the onset of jaundice but not fifty-nine and one hundred and thirty-four days later. 2. A batch of yellow fever vaccine containing pooled human serum obtained from a blood bank produced jaundice in from 30 to 40 per cent of those inoculated with it. Inoculation of the same serum by itself produced hepatitis and jaundice in a similar percentage of volunteers. 3. The icterogenic agent survived heating at 56 C. for one hour and was still very active after storage for fourteen months in the dried state. 4. A number of those inoculated with icterogenic serums showed evidence of liver damage of insufficient severity to produce jaundice. 5. Results obtained on 2 volunteers are not inconsistent with the view that the icterogenic agent present in the blood in homologous serum jaundice is capable of multiplying in tissue culture.

Medical Journal of Australia, Sydney

1:309-332 (April 8) 1944

The Tongue in Medical Diagnosis. D. Anderson.—p. 309.

Plea for Standardization of Lepromin Test. J. W. Fielding and R. G. Cochrane.—p. 313.

Treatment During Convalescence After Head Injury. J. E. Hughes.—p. 316.

Brief Report on Value of Selective Medium of Wilson and Blair for Isolation of Dysentery Bacilli. T. S. Gregory.—p. 319.

Meningitis Due to Haemophilus Influenzae: Review of Treatment. A. G. Nicholson.—p. 320.

1:381-404 (April 29) 1944

Use of Thiourea in Thyrotoxicosis: Report of 8 Cases. F. L. Ritchie and B. L. Geddes.—p. 381.

Cerebrospinal Fluid Protein and Intracranial Tumors. G. Phillips and G. Goswell.—p. 390.

Lead Content of "Normal" Urine. L. A. Meston.—p. 392.

1:405-428 (May 6) 1944

Preventive Medicine: Point of View. G. C. Wilcocks.—p. 405.

*Further Observations on Congenital Defects in Infants Following Infectious Diseases During Pregnancy, with Special Reference to Rubella. C. Swan, A. L. Tostevin, Helen Mayo and G. H. B. Black.—p. 409.

Training of Medical Officers for War. M. A. Rees.—p. 413.

Congenital Defects in Infants Following Rubella During Pregnancy.—Maternal rubella in the early months of pregnancy may be followed by congenital defects (cataract, heart disease, deaf-mutism, microcephaly and glomerular sclerosis) in the infants born subsequently. This had been pointed out by Swan and his collaborators in the *Medical Journal of Australia*

(2:201 [Sept. 11] 1943; abstr. *THE JOURNAL*, Dec. 25, 1943, p. 1144). Since then the authors have had the opportunity of studying a further series of cases. They report 12 cases of rubella (German measles) during pregnancy. Ten of the subsequently born infants exhibited congenital defects such as cataract, deaf-mutism, heart disease, microcephaly and obliteration of the bile ducts. All of the 10 mothers with congenitally defective children had contracted rubella within the first three months of pregnancy. The mother of an infant with congenital cataract, heart disease and microcephaly was unaware of any disease during pregnancy. One woman who had mumps and rubella at a late stage of pregnancy gave birth to a normal infant. Every effort should be made to acquaint the general public with the possibility that maternal rubella early in pregnancy may be followed by congenital abnormalities in the infants born subsequently. Their reasons are as follows: 1. German measles is looked on as such a mild disease that many patients fail to see a medical attendant. 2. If they were aware of the danger, pregnant women would take every care to avoid contact with patients suffering from rubella. 3. If the disease was prevalent, such women could report to their medical attendants with a view to receiving prophylactic inoculations of serum.

Proceedings of Royal Society of Medicine, London

37:241-308 (April) 1944

Lavoisier and History of Respiration. E. A. Underwood.—p. 247.

Audibility of Radio Voice. T. B. Jobson.—p. 263.

Clinical Observations on Acute Catarrhal Otitis Media. G. D. Hoople and I. H. Blaisdell.—p. 270.

Relative Importance of Periosteum and Endosteum in Bone Healing and Relationship of Vitamin C to Their Activities. G. H. Bourne.—p. 275.

Ossifying Chondroma Replacing Infrapatellar Pad of Fat. P. B. Roth.—p. 279.

Posterior Dislocations of Hip Associated with Fracture. G. Hammond.—p. 281.

Hypermobile Ankle. J. G. Bonnum.—p. 282.

Schweizerische medizinische Wochenschrift, Basel

73:865-888 (July 10) 1943. Partial Index

*Dextrose Tolerance Test After Cranial Trauma. H. Roth.—p. 865.

Studies on Sympathetic Nervous System in Persons who Stutter. R. Luchsinger.—p. 868.

Observations on Breast Fed Infants. I. A. Alantar.—p. 870.

Perlingual Administration of Ovarian Hormones. H. von Wattenwyl.—p. 871.

Vitamins and Conserved Milk. M. von der Muhll.—p. 874.

Clinical Aspects and Therapy of B Hypovitaminosis.—A. Kappert.—p. 874.

Dextrose Tolerance Test After Cranial Trauma.—Roth performed sugar tolerance tests on 45 patients with cranial injuries. The usual number of tests made was three or four. All patients with commotio cerebri or with injuries associated with it showed elevated values in dextrose tolerance tests. This disturbance in the carbohydrate metabolism is manifestation of an impairment of the corresponding sympathetic centers. A normal blood sugar tolerance curve, provided the tolerance test is made not later than the third day, rules out a traumatic lesion of the brain. The degree of elevation of the blood sugar values and of the derangement of the blood sugar curve does not parallel the severity of the cerebral lesion. Repetition of tolerance tests at intervals of from four to eight days are more valuable than a single test. The blood sugar curve becomes normalized the sooner, the milder the cerebral commotion. The severity of the commotion is indicated not by the maximal height of the curve but rather by the time that elapses before normalization of the curve. The tolerance test is a more precise indicator of the disturbances caused by the commotio cerebri than are the complaints of the patient. In the majority of cases the blood sugar curve still reveals elevated sugar values when the subjective symptoms have already subsided. In only 2 cases did subjective complaints persist after the sugar curve was normal again, and 1 of the patients was a psychopath. The tolerance curve is positive even in mild cases in which subjective symptoms are absent or obscure. Thus it is of value when the history is inaccurate or unreliable, and even more important from the prognostic and therapeutic points of view. The author allows the patients to get up as soon as the tolerance test curve is normal unless other symptoms contraindicate it. It is no longer necessary to keep patients in bed for three or four weeks. Another advantage is that the test is

objective and an aid in possible medicolegal questions. It is a valuable addition to the classic symptoms but should not be overemphasized to their detriment.

73: 913-936 (July 24) 1943

- Effects of Sounds, Particularly Damaging Effects of Sounds on Ear. L. Riedel.—p. 913.
Late Results After Surgical Treatment of Fractures of Leg. H. G. Bodmer.—p. 917.
Degenerative and Regenerative Action of Sex Hormones on Gonads and Hypophysis of Mature Male Albino Rats. C. A. Joel.—p. 921.
Pneumococcal Meningitis and Chemotherapy. P. Silberschmidt.—p. 922.
Plasmatic Activator of Prothrombin. R. Feissly.—p. 925.

Plasmatic Activator of Prothrombin.—Feissly says that if a clear plasma is prepared by centrifugation from blood that has been rendered noncoagulable and if then the fibrinogen is extracted, a plasma rest is obtained which contains a thrombin forming system. Plasma rests are capable of producing an active thrombin. The author is concerned with the question Is the plasmatic activator of prothrombin a protease or does the plasma contain an autonomous thermolabile thrombokinase, independent of the plasmatic proteases which are also thermolabile? He presents records of the results of experiments which were carried out to solve this problem. These lead him to the conclusions that (1) an autonomous plasmatic thrombokinase exists, (2) this thrombokinase does not possess proteolytic properties and (3) the plasmatic proteases cannot be considered as activators of prothrombin. The author lists observations which demonstrate the independence of the proteases and of the plasmatic thrombokinase. The proteases are inactivated at 56 C., but a temperature of 60 C. is necessary to inactivate the plasmatic thrombokinase. An "absorbed plasma," free of proteases but with the thrombokinase function still preserved, can be obtained by submitting an oxalated plasma to the action of certain mineral absorbents. A solution containing prothrombin and the proteases of plasma can be obtained by elution of the precipitated absorbent. These and other observations recounted in this report seem to oppose the notion according to which a proteolytic enzyme must be considered as the plasmatic activator of prothrombin. On the contrary, this activator appears to be a substance devoid of proteolytic properties and probably a thermolabile phosphatidoproteic link.

Archivos de Medicina Infantil, Havana

13:3-70 (Jan. Feb. March) 1944. Partial Index

- *Rheumatic Fever in Cuban Children. R. Pérez de los Reyes, H. de la Torre, J. Labourdette and J. A. Junco.—p. 3.
Typhoid Osteitis: Case. J. G. Cabrera Calderin, R. Pereiras and J. M. Labourdette Scull.—p. 40.

Rheumatic Fever in Cuban Children.—Pérez de los Reyes and his collaborators reviewed the clinical electrocardiographic and orthographic records of 100 children with rheumatic fever observed in the Department of Heart Diseases of a Municipal Hospital for Children in Havana. The incidence was 30 per cent higher in girls than in boys. It was greater for children between the ages of 5 and 11 than in either younger or older children. The disease was rare in children belonging to well-to-do families. It was more frequent in white children than in either mulattos or Negroes. The hyperacute form with death within one or two weeks was observed in 2 girls. The acute form of the disease was observed in 10 boys and 3 girls, the subacute form in 4 boys and 4 girls and the chronic form in 33 boys and 30 girls. Myocarditis occurred in 28 boys and 34 girls, pancarditis in 2 boys and 4 girls, valvulitis in 43 boys and 47 girls and pericarditis in 1 boy and 2 girls. The electrocardiogram was normal in only 8 cases (in 5 boys and 3 girls). There were the following electrocardiographic changes: sinusual arrhythmia 6 per cent, complete arrhythmia 1 per cent, right deviation of the axis 20 per cent, left deviation of the axis 6 per cent, a P wave either widened or high 9 per cent, a P wave either bifid or biphasic 23 per cent, an increased PR space 20 per cent, a "notched" 2-R-5 complex 15 per cent, bundle-branch heart block 1 per cent, an unlevelled ST space 2 per cent, a low voltage T wave 18 per cent, a negative T wave in two leads 7 per cent and auriculoventricular dissociation 3 per cent. Orthodiagram examinations were carried out on 32 boys and 32 girls. The size and form of the cardiac area was normal in 3 boys. It was greatly increased in 14 boys and 5 girls, moderately increased in 13 boys and in 17 girls and

slightly increased in 2 boys and 10 girls. Half the number of patients in each group had anemia of either the first or the second degree. In none of the cases had a tonsillectomy been previously performed. Sixteen boys and 18 girls suffered with chronic tonsillitis and 3 boys and 6 girls with focal infection in the mouth. Adenoids were observed in 1 boy and 2 girls. One boy had sinusitis and another boy had chronic otitis media. The basic therapy consisted of sodium salicylate, which should be administered at proper doses early in the course of the disease and for as long as it is necessary. Rest of the patients for long periods, removal of focal infection, administration of a proper diet, vitamins, and sojourn of the patients in proper climate are useful adjuvant measures.

Prensa Médica Argentina, Buenos Aires

31:859-906 (May 10) 1944. Partial Index

- *Weil's Disease Without Jaundice: Case. H. R. Rugiero and L. Charosky.—p. 885.
New Method for Control of Hypoglycemic Coma in Prevention of Irreversible Coma. C. R. Pereyra.—p. 887.
Trilobular Left Lung: Pleuroscopic Diagnosis. O. A. Garre and J. A. Marti.—p. 893.

Weil's Disease Without Jaundice.—Rugiero and Charosky urge agglutination tests for leptospiras as a routine for the diagnosis of atypical forms of Weil's disease. The authors observed 5 cases of the disease at the Penna Institute. The disease was atypical in 1 of the patients. Neither nervous symptoms nor jaundice accompanied the disease. Otherwise the clinical symptoms were typical. The patient lived in a region in which contaminated dogs and rats had been previously found. The agglutination test for *Leptospira canicola* was strongly positive (1:200).

The Chinese Medical Journal, Chengtu

61: No. 2 (Jan.) 1943. Partial Index

- *Changing Concepts Regarding Etiology and Treatment of Peptic Ulcer. A. E. Best.—p. 47.
Studies on Control of Fecal Borne Diseases in North China: XIV. Approach to Quantitative Study of House Frequenting Fly Population: D. The Breeding Habits of Common North China Flies. C. H. Meng and G. F. Winfield.—p. 54.
*Scarlet Fever in Tsinan: An Analysis of 309 Cases. P. L. Fan and C. C. Pi.—p. 56.
Evaluation of Pickled Vegetables in Dissemination of *Ascaris Lumbricoides*. K. Chang and H. T. Chin.—p. 63.
Incidence of Convulsions in Childhood: Study of 4,386 Families. Y. En Kao.—p. 70.
Ya Tan Tzu Treatment of Amebic Dysentery. C. C. Wu.—p. 74.
Pa-Pin (Transient Paralysis Simulating Family Periodic Paralysis). H. Keh-Wei.—p. 82.
Report of Case of Canine Leishmaniasis. J. M. Clow.—p. 92.

Changing Concepts in Etiology and Treatment of Peptic Ulcer.—Best reviews the etiology of peptic ulcer and favors the vascular theory. The formerly popular antacid method of treatment is going out of favor. From observations on 37 cases a regimen is offered which consists of frequent bland meals, sufficient exercise, emotional control, adequate warmth and minimal or preferably no medication.

Scarlet Fever.—Fan and Pi say that during the past seven years two epidemics of scarlet fever occurred in Tsinan. This report deals with an analysis of 309 patients with scarlet fever observed in the Cheeloo Pediatric Division between 1928 and 1937. Scarlet fever was rare in infants of less than 1 year. Most of the patients were from 2 to 6 years of age. A single throat culture revealed *Streptococcus haemolyticus* in 80 per cent of the cases. The onset was abrupt. Fever, sore throat, vomiting and skin rash were the common early symptoms. Convulsions, abdominal pains, chills and delirium were uncommon. Complications such as tonsillitis, cervical abscesses, otitis media and nephritis were fewer in the serum treated group. There was 1 girl who had two attacks of scarlet fever within four years. Five patients with nephritis completely recovered. The mortality rate for serum treated patients was 13.9 per cent and for non-serum treated patients 24.6 per cent. Serum sickness occurred in 33 1/3 per cent of the 72 serum treated patients. The source of infection could be determined for 70 patients. Fifty of these contracted the disease from their family members and 20 from their school mates or neighbors. Of 95 adults exposed to scarlet fever, 28 contracted the infection and 5 died. Of 233 children exposed to scarlet fever 95 contracted the disease, and of these 32 died.

Book Notices

Medicine and the War. Edited by William H. Tallafiero. Cloth. Price, \$2. Pp. 193, with illustrations. Chicago: University of Chicago Press, 1944.

This book owes its origin to a series of lectures given by members of the Division of the Biological Sciences of the University of Chicago in the spring of 1943 under the sponsorship of the Charles R. Walgreen Foundation for the Study of American Institutions. The various subjects (historical background, food, chemotherapy, malaria, insect carriers, shock and blood substitutes, aviation medicine, cerebral injuries, psychiatry and chemical warfare) are well chosen and arranged in a logical sequence. The result is a well rounded picture of medical advances important in modern warfare and, on the other hand, of the many problems modern warfare poses to medicine. However, if the reader expects the title of the book to refer to the present conflict exclusively he will be somewhat disappointed. The desire to make the audience understand the matter under discussion (the book anticipates lay readers) often shifts the emphasis to outlines of physiologic, pharmacologic and pathologic theories. Moreover, in a good many cases such facts and documentation as are given relate to experiences of the last war and the prewar period. The connection with the present war thus tends to be loose and, as a whole, the book has a decidedly academic character. There is, on the other hand, a wise restriction to relatively few but illustrative examples. The chapter on neurologic and psychologic effects of cerebral injuries, which is mainly devoted to the consequences of lesions of the frontal lobes, may be cited as an instance of lucid presentation.

The book has an advantage over similar popular publications in avoiding exaggeration and overdramatization. The calm and dignified tone that was to be expected from the distinguished contributors does not allow the reader to forget that war is an evil, however necessary it may be and however great a stimulus to medical progress.

Mitosis: The Movements of Chromosomes in Cell Division. By Franz Schrader, Professor of Zoology, Columbia University, New York. Cloth. Price, \$2. Pp. 110, with 15 illustrations. New York: Columbia University Press, 1944.

This monograph reviews critically the work on the mechanisms of cell division. The distribution of chromosomes to new cells is a complicated but well ordered process, a thorough understanding of which is essential to advance in the study of problems of cell behavior. A number of hypotheses have been advanced to explain the movements of chromosomes, but to the author no final solution is in sight. The trouble seems to be "that nearly all the hypotheses have been built around the idea that a certain, single type of force underlies all mitotic activity." It now seems clear that "mitosis is comprised of a great complex of different mechanisms." The review ends constructively in the recommendation that at present research better be concentrated on single, limited phases of mitosis in favorable species rather than directed to the immediate complete analysis of the whole mitotic cycle.

Absence from Work: Prevention of Fatigue. Conditions for Industrial Health and Efficiency, Pamphlet No. 2. Issued by the Industrial Health Research Board of the Medical Research Council. Paper. Price, 3d. Pp. 20, with 4 illustrations. London: His Majesty's Stationery Office, 1944.

This pamphlet is the second in a series issued by the Industrial Health Research Board of the Medical Research Council intended to improve and safeguard industrial health and efficiency. It states at the outset that industrial productivity is dependent on the health, efficiency and enthusiasm of the workers. The factors leading to absence from work as they relate to conditions inside the factory, outside influences and the status of the workers' minds and bodies are all succinctly listed. In this last connection, certain measures calculated to relieve boredom and indifference are described, such as rest periods, judicious use of music, the introduction of competition and a definite knowledge of what the process means to the finished product. Individual workers, joint productive committees and

works councils all must contribute to improve attitude, work environment and interest in healthful living. The effect of fatigue on productivity expresses itself in lowered output, lowered quality of work, more accidents and behavior of the workers. Causes of fatigue are the length and intensity of the work period, working conditions, lack of suitable incentive and improper rest and relaxation away from the plant. Each suggests a remedy, and the remedies are sensibly presented.

Psychiatry for Nurses. By Louis J. Karnosh, B.S., Sc.D., M.D., Associate Clinical Professor of Nervous Diseases, School of Medicine, Western Reserve University, Cleveland, and Edith B. Gage, R.N. In collaboration with Dorothy Mereness, A.B., M.N., R.N., Instructor of Psychiatric Nursing, Neuropsychiatric Division, City Hospital, Cleveland. Second edition. Cloth. Price, \$2.75. Pp. 339, with 38 illustrations. St. Louis: C. V. Mosby Company, 1944.

This is one of the most practical textbooks on psychiatry for nurses. Here is a book that is written clearly and simply. The authors fully realize that their subject must be presented concisely and with utmost simplicity because of the many other subjects the nurse must take during the course of her training. With this point of view the reviewer heartily agrees. After each of the twenty-nine chapters there is a list of questions which can be used to good advantage. There is also a bibliography. This book is highly recommended to all nurses, both undergraduate and graduate, and also to general practitioners of medicine.

A Manual of Physical Therapy. By Richard Kovács, M.D., Professor of Physical Therapy, New York Polyclinic Medical School and Hospital, New York. Third edition of "Physical Therapy for Nurses." Cloth. Price, \$3.25. Pp. 309, with 118 illustrations. Philadelphia: Lea & Febiger, 1944.

This is the third revised edition of a book formerly published under the title "Physical Therapy for Nurses." It is divided into six parts: Part I is an introduction dealing with physical forces and the history of physical therapy, part II deals with heat and light, part III with electricity, part IV with hydrotherapy, part V with massage and exercise and part VI with applied physical therapy. The sections on heat and light and on electrotherapy have been considerably revised, and new illustrations have been added in this edition. The section dealing with massage and exercise has been amplified, and a new final chapter on "Physical Therapy in War" is a timely addition. This textbook should continue to serve as a valuable manual for teaching physical therapy to nurses, and it can also be considered a useful volume for the physician who is unfamiliar with physical medicine and who desires a rapid survey of the elementary aspects of the field. The revisions which have been made are distinctly worth while. Kovács's facile pen has made another valuable contribution to the broad field of physical medicine.

The Psychology of Women: A Psychoanalytic Interpretation. By Helene Deutsch, M.D., Associate Psychiatrist, Massachusetts General Hospital, Boston. Foreword by Stanley Cobb, M.D., Bullard Professor of Neuropathology, Harvard University, Boston. Volume I. Cloth. Price, \$4.50. Pp. 399. New York: Grune & Stratton, Inc., 1944.

Those who are familiar with the writings of Helene Deutsch have come to expect from her publications sound, carefully studied and clinically illustrated scientific observations. The present volume lives up to such expectations in every particular. The author states in the preface that "the purpose of this book is to explain the normal conflicts. We know that the degree of psychic health is not determined by the absence of conflicts but by the adequacy of the methods used to solve and master them." Exhaustive case material is presented to illustrate the validity of conclusions reached from psychoanalytic investigation into problems of feminine development. In the present work, which is the first of two volumes, the author discusses the individual development and personality of women. This volume contains ten chapters, on prepuberty, early puberty, puberty and adolescence, menstruation, eroticism, the feminine woman, feminine passivity, feminine masochism, the "active" woman, the masculinity complex, homosexuality and the influence of the environment. The bibliography and the index are excellent. This book not only will interest the psychiatrist, the psychologist, the physician and the student but may be read with understanding and profit by mothers and young women who hope to be mothers.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

REFRACTORY EDEMA OF LEGS

To the Editor:—A patient complains of swelling and pain in the legs, dyspnea and thirst at night. She has had these complaints for about six months. The history is essentially normal. The patient is a woman aged 60 weighing 190 pounds (86 Kg.). The heart sounds are poor; no murmur is audible. The blood pressure is 140/78, the pulse rate 90. The lungs are clear, and the abdomen is normal. The legs show a number of large varicose veins and are edematous. There are on each leg a number of bright red areas varying in size from 0.5 cm. to 1 inch. They are tender, superficial and, on palpation, feel like thrombotic veins. These areas are found between the knees and the ankles. The blood sugar is 104 mg.; urine, blood and electrocardiogram are normal. Digitalization has not improved the legs, although it has helped the dyspnea and reduced the pulse rate to 78. Mercupurin, foreign protein therapy and aminophylline have also been tried. What additional therapeutic measures may be suggested?

M.D., Pennsylvania.

ANSWER:—The stubbornness and resistance to treatment in this case at once suggest Quincke's disease, or angioneurotic edema. This condition is characterized by such swelling as is described together with the itching. It is assumed in this diagnosis that the red areas are in the nature of urticarial wheals. If these areas come and go rapidly they are almost sure to be allergic in origin. The dyspnea and thirst may represent swelling about the throat and palate. Has such swelling been observed in this case? The treatment of this disease is quite unsatisfactory. An allergen must be sought, and the usual measures that are employed against allergic disorders are used, but much is left to be desired.

Other circulatory disturbance in the lower part of the legs must be considered. Circulatory disturbance in the lower part of the legs will not explain dyspnea, but the improvement of the dyspnea under digitalis administration suggests the presence of an associated deficiency of the coronary circulation. Dyspnea due to congestive heart failure is not likely with clear lungs. The presence of varicose veins, swelling and pain suggests acute thrombophlebitis. If the red and tender areas are really thrombosed veins, support is given to this diagnosis. At any rate, if the red and tender areas are inflammatory and not allergic they should be treated by rest and elevation of the legs. The use of a sulfonamide might hasten the control of the active infection. The addition of ammonium chloride to the therapeutic measures already used might be helpful. After the subsidence of the acute inflammatory process the circulation should be restored as far as possible.

SYPHILITIC RELAPSE OR REINFECTION

To the Editor:—A diagnosis of primary syphilis was made on a Negro soldier, aged 18, by means of a positive darkfield examination of penile ulcer. Blood serologic tests were negative at this time. Treatment was begun immediately and followed the routine mapharsen injections twice weekly for ten weeks, with bismuth weekly the first five weeks. The chancre healed rapidly and completely. Treatment was started on Jan. 12, 1944. Because the patient neglected to take his treatment promptly on every occasion, the number of mapharsen injections was increased to twenty-five and completed April 24. Three days later the first of a series of six weekly bismuth injections was begun. The next day the patient noticed a lesion on his penis in a different location from the original one. Darkfield examination revealed the lesion to be teeming with spirochetes. Would you kindly interpret this case for me and suggest a course of treatment.

Lieutenant, M. C., A. U. S.

ANSWER:—In this case the question of differential diagnosis between reinfection and monorelapse would have to be considered. Ordinarily, with a monorelapse the process returns on the site of the old primary lesion. That is not necessary, however. Nothing is said as to the condition of the draining lymph nodes and whether the same chain of nodes is involved in the second infection that was involved in the first.

As the patient in question was irregular in his treatment, the chances are that he has a relapse type of syphilis. In an early relapse like this, one would find spirochetes locally just as with a chancre.

A condition like this should be treated as acute syphilis. There should be no difficulty in getting treatment with penicillin, hospitalization and intramuscular injections in the buttocks as is recommended for this disease when penicillin is employed.

INTERMITTENT BURNING OF PALATE

To the Editor:—A woman aged 32, the mother of 2 children, for the past four years has complained of an intermittent burning in the hard palate. At times she insists that small blisters and cracks appear, but I have never been able to identify them. Diet is adequate, and careful blood study has not revealed any abnormalities; there has been no response to treatment with adequate amounts of vitamin B complex and multivitamin preparations. The burning is bilateral and involves the anterior portion of the palate. The complaint began following a cervical amputation for severe erosion and laceration. Preceding the operation the patient complained of numbness and tingling in the fingers, which cleared up following the operative procedure. The patient otherwise is neurotic and of poor emotional control, with frequent outbursts against children and husband. When situations arise which provoke emotional response on her part, the burning in the mouth becomes worse. However, she refuses to accept the idea of psychogenicity or permit psychotherapy. The burning is somewhat relieved by application of topical anesthesia. An oral surgeon has advocated alcohol injection of the palatine nerves. Although it is probable that this patient's complaint is largely hysterical in nature, in view of the relief with topical anesthesia and rejection of a more fundamental approach via psychotherapy do you think alcohol injection may prove beneficial? Are any harmful sequelae likely to ensue? Any other suggestions will be welcomed.

M.D., New York.

ANSWER:—Does the patient have any trigger zones in the tonsillar regions? Has she free acid in her stomach contents? From the description the patient is not afflicted with a neuralgia but with a neurosis. It is doubtful that an injection of alcohol into the foramen rotundum or in the gasserian ganglion would have an anesthetizing effect. Although the palatine nerves are branches of the maxillary division of the trigeminal nerves, they are supposed to be related to the 7th and 9th cranial nerves. In this case it is bilateral and both sides would have to be injected. Harmful sequelae are not likely to ensue. Sight must not be lost of the fact that if this patient is neurotic and does get a permanent anesthesia she may be quite disturbed about the numbness. The topical applications might be continued. If the burning becomes uncontrollable, one side may be injected. Before it is done, however, the patient should be fully acquainted with the fact that her palate may become numb.

PHOTOELECTRIC COLORIMETERS

To the Editor:—What is the present status of photoelectric colorimeters? Which is the best make at the present time for general laboratory use?

M.D., Ohio.

ANSWER:—The amount of a substance in solution is measured in a visual type of colorimeter by matching the brightness of two adjacent fields. The accuracy of the determination depends on the sensitivity of the eye as well as other factors, such as fatigue and after-images and individual variation. It is often difficult to check readings satisfactorily, especially with different observers. In a photoelectric colorimeter most of these sources of error are eliminated. Here the concentration of a substance in solution is measured by the amount of deflection of the pointer of a sensitive electric meter. If the instrument meets certain requirements (see Bureau of Standards Letter Circular LC-473), readings are rapid and accurate. All good photoelectric colorimeters provide also for the use of color filters. These add to the usefulness of the instrument by limiting the transmitted light to a relatively narrow spectral region in which there is the greatest change in transmission with a change in concentration of the substance to be determined. Photoelectric colorimeters are rapidly replacing the visual type in most laboratories. The main problem is expense, but accurate and well constructed instruments are now available at moderate prices. The Klett-Summerson and the Cenco instruments are both satisfactory and can be highly recommended for routine clinical laboratory use.

TRAUMATIC FRACTURE WITH INTACT PERIOSTEUM

To the Editor:—Is it possible to have a fracture due to external trauma without loss of continuity of the periosteum?

Lieutenant, M. C., A. U. S.

ANSWER:—It is possible to have a fracture due to external violence without loss of continuity of the periosteum. This membrane in youths, adolescents or young adults is highly vascularized, pliable and elastic. The bone beneath, therefore, may be fractured across or in a spiral from external twisting violence, permitting the periosteum to escape tear. This does not often happen. There may be only small tears in many cases. When the periosteum remains intact a hematoma forming between it and the underlying cortex is confined and after organization forms the basis for late developing callus formation. This mechanism is illustrated in so-called march fractures or "pied forcé," in which at first the fracture plane does not appear in the roentgenogram but comes out three to six weeks later with callus formed beneath the raised periosteum.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 2

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

SEPTEMBER 9, 1944

PENICILLIN TREATMENT OF EARLY SYPHILIS: II

J. F. MAHONEY, M.D.

R. C. ARNOLD, M.D.

BURTON L. STERNER, M.D.

AD HARRIS

Serologist

AND

M. R. ZWALLY, M.A.

U. S. Public Health Service

STATEN ISLAND, N. Y.

In a preliminary report¹ the influence of penicillin therapy on the clinical manifestations and serologic reactions of patients with early syphilis was presented. The report was based on the results of a curtailed period of observation of a group of 4 patients. It is our purpose in the present paper to record the findings of post-treatment observation of the original group for periods in excess of three hundred days. It is also desired to record certain items of information which have resulted from the treatment of an additional 100 patients.

REVIEW OF ORIGINAL GROUP

Of the group of 4 patients the records of whom formed the basis for the preliminary report,¹ all have been maintained under observation. It will be recalled that these patients displayed dark field positive lesions of early syphilis at the time of treatment. The therapy consisted of an intramuscular injection of 25,000 units of penicillin administered at four hour intervals for forty-eight injections. The total amount of the product utilized was 1,200,000 units and the total time of therapy was about eight days. No other antisyphilitic medication has been employed. The post-treatment observation has consisted of a clinical and serologic examination at weekly intervals for the first six months and monthly observations thereafter. A spinal fluid examination was carried out at the completion of six months post-treatment observation.

Three members of the original group experienced a rapid healing of penile ulcerations and attained seronegativity within the initial three months of observation. These patients have remained clinically and serologically negative up to the present. The remaining patient has displayed circumstances which warrant discussion.

In this patient the penile lesion healed promptly and the serologic tests were recorded as negative on the

71st day. This situation maintained until the 286th day of observation, at which time strongly positive reactions were recorded in all test procedures. At that time the patient was under treatment for specific urethritis in a distant clinic. After some delay the patient was again made available for study and was found to have a single ulcerative lesion, on an indurated base, located on the inner surface of the lower lip. The regional lymph glands were enlarged and firm. There was no other evidence of involvement of skin or mucous membranes or of general adenopathy. Dark field examination of secretions secured from the lesion, after all precautions had been taken to avoid the contamination of the specimen by mouth spirochetes, was considered to be positive for *Treponema pallidum*.

Although this patient is being classed as a treatment failure, the probability of reinfection is inescapable. Retreatment with penicillin has been carried out.

Table 1 shows the serologic record of the first patient treated with penicillin for early syphilis. Table 2 shows the complete serologic record of patient 4, including serologic relapse or serologic upstroke accompanying reinfection.

In continuing the general study a series of approximately 100 patients have been treated in essentially the same manner as was employed in the original group. Although the post-treatment period of observation has not been of sufficient duration in a large enough group to warrant the drawing of conclusions, some interesting observations may be presented at this time. These are presented as informative material only and with the understanding that they may or may not be substantiated by more complete data.

The principal clinical features of the study may be summarized in the following manner:

The therapy has consisted of an intramuscular injection of 20,000 units of penicillin administered at three hour intervals, night and day, for sixty injections. The total amount of penicillin employed was 1,200,000 units. No other antisyphilitic medication has been used. All patients have been managed in a uniform manner, and it has not been necessary to decrease dosage or abandon the therapy in any instance. With three exceptions (acute arsenical intoxications) all the patients have displayed lesions characteristic of early syphilis (primary and/or secondary).

Herxheimer-like reactions, or therapeutic shock, of varying degrees of severity were observed during the first day of treatment in 86 patients. Ulcerations and cutaneous lesions manifested a tendency toward prompt recession. All uncomplicated ulcers were completely epithelized at the time of completion of treatment. No severe toxic reactions have been encountered. There were 2 instances of exfoliative dermatitis, 1 mild in character and of short duration, the second more severe

From the Venereal Disease Research Laboratory and the United States Marine Hospital.

Read in a panel discussion on "Penicillin in the Treatment of Syphilis" before the Section on Dermatology and Syphilology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Mahoney, J. F.; Arnold, R. C., and Harris, A.: Penicillin Treatment of Early Syphilis: A Preliminary Report, *Ven. Dis. Inform.* 24: 355-357 (Dec.) 1943.

and requiring about three weeks for return to normal. The two patients had been treated with the same manufacturer's lot of material. As other irritative qualities were attributed to this particular product, the possibility of impurities being accountable for the skin reaction is present.

consideration of this phase the records of patients who have had in excess of seventy-five days satisfactory follow-up observation have been selected for scrutiny.

It may be well to state that the serologic routine which has been utilized in this study represents as complete a coverage as is practical; a total of seven

TABLE 1.—Results of Serologic Tests in Case 1

Duration of Disease, Nine Days										
Time After Start of Therapy	Qualitative Methods							Quantitative Methods		
	Super-sensitive Kline Exclusion	Diagnostic Flocculation					Complement Fixation, Kolmer Simplified	Diagnostic Flocculation		Complement Fixation, Kolmer
		Mazzini	Kline Diagnostic	Rahn Standard	Hinton	Eagle		Mazzini	Rahn	
Days										
0	..	4	..	4	Pos	Pos	4	4 4 4 2 1 -	4 4 4 2 ±	4 4 4 4 1
1	..	4	..	4	Pos	Pos	4	4 4 4 2 1 -	4 4 4 2 ±	4 4 4 4 1
9	4	4	4	4	Pos	Pos	4	4 4 4 4 2 -	4 4 4 4 1 -	4 4 4 4 2 -
23	..	4	..	3	Pos	Pos	4	4 3 2 - - -	4 4 1 - - -	4 4 4 3 ±
30	4	4	3	3	Pos	~	4	4 4 4 2 - -	4 4 3 1 - -	4 4 4 2 ±
37	4	4	1 Dbt	3	Dbt	~	3	4 4 2 1 - -	4 1 - - - -	3 3 2 ± -
44	3	4	1 Dbt	1 Dbt	~	~	4	4 3 2 - - -	4 ± - - - -	4 4 3 ± -
51	1 Dbt	4	~	~	~	~	4	4 2 - - - -	1 - - - - -	4 4 1 ± -
58	1 Dbt	4	~	~	~	~	~	4 3 - - - -	1 - - - - -	~
65	2	2 Dbt	~	~	~	~	~	2 1 - - - -	~	~
72	1 Dbt	2 Dbt	~	~	~	~	~	2 1 - - - -	~	~
80	~	2 Dbt	~	~	~	~	~	2 ± - - - -	±	~
86	~	2 Dbt	~	~	~	~	~	2 - - - - -	~	~
93	~	1 Dbt	~	~	~	~	~	1 - - - - -	~	~
Months										
4	~	~	~	~	~	~	~	~	~	~
5	~	~	~	~	~	~	~	~	~	~
6	~	1 Dbt	~	~	~	~	~	~	~	~
7	~	~	~	~	~	~	~	~	~	~
8	~	~	~	~	~	~	~	~	~	~
9	~	~	~	~	~	~	~	~	~	~
11	~	1 Dbt	~	~	~	~	~	~	~	~

TABLE 2.—Results of Serologic Tests in Case 4

Duration of Disease, Light Days										
Time After Start of Therapy	Qualitative Methods							Quantitative Methods		
	Super-sensitive Kline Exclusion	Diagnostic Flocculation					Complement Fixation, Kolmer Simplified	Diagnostic Flocculation		Complement Fixation, Kolmer
		Mazzini	Kline Diagnostic	Rahn Standard	Hinton	Eagle		Mazzini	Rahn	
Days										
0	..	1 Dbt	..	1 Dbt	—	—	—	2 1 — — — —	3 ± — — — —	± ± ± — — —
1	4	4	± Dbt	3	—	Pos	4	3 2 — — — —	4 4 ± — — —	4 4 4 2 ± — —
8	..	4	..	3	—	Pos	—	4 3 2 1 — — —	4 3 1 — — —	± ± ± ± — —
15	4	4	1 Dbt	3	Pos	Pos	± Dbt	3 1 — — — —	4 1 ± — — —	± 1 ± — — —
22	4	3	± Dbt	3	Pos	Dbt	± Dbt	2 1 — — — —	1 — — — — —	± ± 1 ± — —
30	1 Dbt	2 Dbt	± Dbt	—	—	—	—	2 — — — — —	± — — — — —	— ± ± ± — —
36	± Dbt	2 Dbt	—	—	—	—	—	2 1 — — — —	± — — — — —	— — — — — —
43	—	2 Dbt	—	—	—	—	—	1 — — — — —	— — — — — —	— — — — — —
50	± Dbt	1 Dbt	—	—	—	—	—	1 — — — — —	± — — — — —	— — — — — —
57	—	1 Dbt	—	—	—	—	—	1 — — — — —	— — — — — —	— — — — — —
64	± Dbt	1 Dbt	—	—	—	—	—	1 — — — — —	— — — — — —	— — — — — —
71	—	—	—	—	—	—	—	— — — — — —	— — — — — —	— — — — — —
78	—	—	—	—	—	—	—	— — — — — —	— — — — — —	— — — — — —
86	—	—	—	—	—	—	—	— — — — — —	— — — — — —	— — — — — —
93	—	—	—	—	—	—	—	— — — — — —	— — — — — —	— — — — — —
Months										
4	—	—	—	—	—	—	—	— — — — — —	— — — — — —	— — — — — —
5	—	—	—	—	—	—	—	— — — — — —	— — — — — —	— — — — — —
6	± Dbt	—	—	—	..	—	—	— — — — — —	— — — — — —	— — — — — —
7	—	1 Dbt	—	—	..	—	—	— — — — — —	— — — — — —	— — — — — —
8	—	—	—	—	..	—	—	— — — — — —	— — — — — —	— — — — — —
Days										
286	4	4	2	4	..	Pos	4	4 4 4 2 1 — — —	4 4 1 ± — — —	4 4 4 ± — — —
295	4	4	4	4	..	Pos	4	— — — — — —	— — — — — —	— — — — — —
318	4	4	4	4	Pos	Pos	4	4 4 4 4 3 1 — —	4 4 4 4 3 — — —	4 4 4 4 4 ± — —
326	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 1 —	4 4 4 4 4 1 — —	4 4 4 4 4 ± — —

Because of the rapid disappearance of lesions the main reliance in evaluating the therapy has been placed on the serologic tests. On the reasonable assumption that the trend of the serologic reactions may be considered as an index to the progress of early syphilis in the human being, the treated patients may be placed into several rather well defined groupings. For a

accredited methods representing supersensitive and diagnostic flocculation methods, one diagnostic complement fixation technic and three methods with which the reagin content of each positive blood specimen has been quantitated.

On the basis of an arbitrary minimum of seventy-five days of satisfactory post-treatment observation, the

records of 52 patients become available for scrutiny. The average duration of observation is one hundred and thirty-five days.

Of this group of 52 patients, 6 with dark field positive lesions were in the seronegative phase of the disease at the time of treatment and passed through the observation period without positive findings being recorded.

tendency toward a return of the high titer reactions which were recorded at the time of treatment, and it is anticipated that complete reversal will be accomplished with the passage of time. However, there is no assurance of this contingency. There is the possibility that these patients eventually will be added to the favorably reacting groups.

TABLE 3.—Results of Serologic Tests in Case 10: Pattern Considered to Be Favorable

Duration of Disease, Twenty-One Days

Time After Start of Therapy	Qualitative Methods						Com- plement Fixation, Kolmer Simplified	Quantitative Methods		
	Super- sensitive Kline Exclusion	Diagnostic Flocculation				Diagnostic Flocculation		Complement Fixation, Kolmer		
		Mazzini	Kline Diagnostic	Kahn Standard	Hinton	Eagle			Mazzini	Kahn
Days										
0	± Dbt	1 Dbt	—	—	Pos	—	—	1 1 1	—	—
1	1 Dbt	3	—	2	Pos	—	—	3 3 2 1	2 ±	—
3	1 Dbt	3	—	2	Pos	Pos	3	3 3 2 1	2 ±	3 4 4 3 2 ±
8	4	4	4	4	Pos	Pos	4	4 4 3 2 2 1	4 4 2 1 ±	4 4 4 4 4
14	4	4	4	4	Pos	Pos	4	4 4 4 3 2	4 4 2 ±	4 4 4 4 3 ±
20	4	4	1 Dbt	4	Pos	Pos	± Dbt	4 4 3 2 1	4 3 ±	± ± 1 1
28	2	4	± Dbt	3	Pos	—	± Dbt	4 3 2 1 1	4 ± ±	± ± ± ±
35	1 Dbt	2 Dbt	± Dbt	1 Dbt	Pos	—	—	2 2 1 1	3 ±	—
42	± Dbt	2 Dbt	—	—	Pos	—	± Dbt	2 1 1	1	± ±
48	± Dbt	—	—	—	—	—	—	—	—	—
56	± Dbt	1 Dbt	—	—	—	—	—	1	—	± ± ± ±
63	—	1 Dbt	—	—	—	—	—	1	—	—
70	—	1 Dbt	—	—	—	—	—	1	—	—
77	—	1 Dbt	—	—	—	—	—	1	—	—
85	—	—	—	—	—	—	—	—	—	—
91	—	—	—	—	—	—	—	—	—	± ± ± ±
Months										
4	—	—	—	—	Dbt	—	—	—	—	—
5	± Dbt	—	—	—	—	—	—	—	—	—
6	—	—	—	—	—	—	—	—	—	—
7	—	—	—	—	—	—	—	—	—	—

Pattern showing low reading reactions at the beginning of therapy, with an increase in titer during treatment and a rapid reversal to negative.

TABLE 4.—Results of Serologic Tests in Case 35: High Titer Reactions at Onset of Therapy

Duration of Disease, Sixty-Nine Days

Time After Start of Therapy Days	Qualitative Methods							Complement Fixation, Kolmer Simplified	Quantitative Methods				
	Super-sensitive Kline Exclusion	Diagnostic Flocculation					Complement Fixation, Kolmer		Diagnostic Flocculation				Complement Fixation, Kolmer
		Mazzini	Kline Diagnostic	Kahn Standard	Hinton	Eagle			Mazzini	Kahn			
—1	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 1	—	3 4 4 4 4 4 1	—	4 4 4 4 4 4 1	
1	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 1	—	4 4 4 4 4 3 ±	—	4 4 4 4 4 4 2 ±	
8	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 1	—	4 4 4 4 4 2	—	4 4 4 4 4 4 3 ±	
13	4	4	4	4	Pos	Pos	4	4 4 4 4 4 1	—	4 4 4 4 4 3 ±	—	4 4 4 4 4 4 2	
20	4	4	4	4	Pos	Pos	4	4 4 4 4 3 1	—	4 4 4 4 2 1	—	4 4 4 4 4 4 1 ±	
27	4	4	4	4	..	Pos	4	4 4 3 ±	—	4 3 2 ±	—	4 4 4 4 4 1 ±	
34	4	4	4	4	Pos	Pos	4	4 4 3 2	—	4 3 2 1	—	4 4 4 1	
41	4	4	4	2	Pos	Pos	4	4 3 2 1	—	4 3 ±	—	4 4 4 1	
49	4	4	4	2	Pos	Dbt	4	4 2 2 1	—	4 ±	—	4 4 4 1	
56	4	3	2	± Dbt	..	—	3	3 2 1	—	4 ±	—	3 3 1	
63	4	2 Dbt	1 Dbt	± Dbt	—	—	1	2 2	—	2	—	1 ±	
69	3	2 Dbt	1 Dbt	—	—	—	1	2 1	—	1	—	1 ±	
91	1 Dbt	1 Dbt	—	—	—	—	—	—	—	—	—	—	
99	2	1 Dbt	—	—	Dbt	—	—	—	—	—	—	—	
112	1 Dbt	1 Dbt	—	—	—	—	± Dbt	—	—	—	—	—	
119	1 Dbt	1 Dbt	—	—	—	—	± Dbt	—	—	—	—	—	
126	± Dbt	—	—	—	—	—	—	—	—	—	—	—	
153	± Dbt	—	—	—	—	—	—	—	—	—	—	—	

A representative pattern of patients with secondary syphilis. High titer reactions show a consistent and progressive trend toward reversal to negative.

The records of 25 additional patients display positive serologic reactions in some or all test methods, with a reversal to negative findings during the observation period. The average time for reversal in this group was seventy days. Thus 31 patients may be considered as having responded in a favorable manner up to the present.

In 7 patients there has been a progressive decline in the serologic titer, and although complete reversal in all tests has not been accomplished there has not been a

In an additional group of 7 patients the records display an initial post-treatment trend toward seronegativity with subsequent unmistakable evidence of a return to the high titer reactions. These are considered to be instances of serologic relapse.

The remaining 7 patients have displayed serologic patterns which render difficult the making of a favorable or unfavorable classification at this time. Some pessimism is felt as to the effectiveness of the therapy in this group.

If the patients are grouped in accordance with the stage of the disease at the time of treatment, some items of potential interest become discernible. Of the 52 patients 30 may be classed as having dark field positive primary syphilis. Of this number 1 patient, previously mentioned, developed a clinical relapse nine

at this time. The remaining 25 patients are at this time clinically and serologically negative. Therefore there is a possibility of there being twenty-seven satisfactory responses.

Of the 22 patients who displayed evidence of secondary syphilis and who were well into the seropositive

TABLE 5.—Results of Serologic Tests in Case 8: Relapse Following Initial Favorable Trend

Duration of Disease, Forty-Six Days

Time After Start of Therapy Days	Qualitative Methods							Quantitative Methods		
	Super-sensitive Kline Exclusion	Diagnostic Flocculation					Complement Fixation, Kolmer Simplified	Diagnostic Flocculation		Complement Fixation, Kolmer
		Mazzini	Kline Diagnostic	Kahn Standard	Hinton	Eagle		Mazzini	Kahn	
0	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 --	4 4 4 4 4 4 1 ±	4 4 4 4 4 4 1 --
1	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 1 -	4 4 4 4 4 3 ±	4 4 4 4 4 1 ±
8	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 --	4 4 4 4 4 4 1 -	4 4 4 4 4 4 1 ±
12	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 --	4 4 4 4 4 4 1 --	4 4 4 4 4 4 1 --
19	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 --	4 4 4 4 4 2 ±	4 4 4 4 4 4 2 --
26	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 --	4 4 4 4 4 2 ±	4 4 4 4 4 3 ±
33	4	4	4	4	Dbt	Pos	4	4 4 4 4 4 1 --	4 4 4 1 ±	4 4 4 4 4 ±
40	4	4	4	4	Dbt	Pos	4	4 4 4 4 3 1 --	4 4 2 1 --	4 4 4 4 3 ±
47	4	4	4	4	Dbt	Dbt	4	4 4 3 --	4 4 3 ±	4 4 1 ±
54	4	3	2	3	Dbt	—	4	3 2 2 --	4 3 1 ±	4 4 3 1 --
61	4	4	3	3	Dbt	—	4	4 4 3 2 --	4 2 ±	4 4 4 4 ±
68	4	4	4	3	Pos	—	4	4 4 3 2 --	4 2 ±	4 4 4 4 2 ±
75	4	4	4	4	Pos	Pos	4	4 4 4 2 --	4 4 3 ±	4 4 4 4 2 ±
82	4	4	4	4	Pos	Pos	4	4 4 4 4 3 1 --	4 4 4 4 1 --	4 4 4 4 4 ±
90	4	4	4	4	Pos	Pos	4	4 4 4 4 2 1 --	4 4 4 4 2 --	4 4 4 4 4 ±
93	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 --	4 4 4 4 2 --	4 4 4 4 4 4 3
105	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 1 --	4 4 4 4 4 2 --	4 4 4 4 4 --
110	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 --	4 4 4 4 4 4 ±	4 4 4 4 4 ±
117	4	4	4	4	Pos	Pos	4	4 4 4 4 4 --	4 4 4 4 4 --	4 4 4 4 4 --
124	4	4	4	4	Pos	Pos	4	4 4 4 4 1 --	4 4 4 3 1 --	4 4 4 4 3 --
131	4	4	4	4	Pos	Pos	4	4 4 4 4 3 --	4 4 2 ±	4 4 4 4 2 ±
138	4	4	4	4	Pos	Pos	4	4 4 4 4 1 --	4 4 4 2 --	4 4 4 4 4 1 --
152	4	4	3	4	Pos	Pos	4	4 2 1 --	4 4 3 --	4 4 3 ±
166	4	2 Dbt	1 Dbt	3	Pos	Pos	4	.....	.....	4 4 1 ±
188	4	2 Dbt	± Dbt	± Dbt	Pos	Dbt	± Dbt	.....	.....	± ±
194	4	4	2	—	Dbt	Dbt	4	.....	.....	4 3
201	4	4	2	2	Pos	Dbt	4	4 3 2 --	.....	4 3 2 ±
208	4	4	3	3	Pos	Pos	4	4 4 3 2 --	.....	4 4 3 ±

TABLE 6.—Results of Serologic Tests in Case 68

Duration of Disease, Thirty Days

Time After Start of Therapy Days	Qualitative Methods							Quantitative Methods		
	Super-sensitive Kline Exclusion	Diagnostic Flocculation					Complement Fixation, Kolmer Simplified	Diagnostic Flocculation		Complement Fixation, Kolmer
		Mazzini	Kline Diagnostic	Kahn Standard	Hinton	Eagle		Mazzini	Kahn	
0	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 1 -	± 2 4 2 1 ±	4 4 4 4 4 4 ±
1	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 -	2 4 4 4 2 -	4 4 4 4 4 4 ±
7	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 1 -	2 2 2 2 2 ±	4 4 4 4 4 4 ±
11	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 --	2 4 4 4 1 ±	4 4 4 4 4 4 ±
18	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 1 -	± 4 3 2 ±	4 4 4 4 4 ±
25	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 --	2 4 4 4 3 --	4 4 4 4 4 4 ±
32	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 --	4 4 4 4 3 1 --	4 4 4 4 4 3 ±
39	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 --	2 4 4 4 3 ±	4 4 4 4 4 4 ±
46	4	4	4	4	Pos	Pos	4	4 4 4 4 4 3 1 -	2 4 4 4 2 ±	4 4 4 4 4 4 ±
53	4	4	4	4	Pos	Pos	4	4 4 4 4 2 1 --	± ± 1 1 ±	4 4 4 4 3 --
60	4	4	4	4	Pos	Pos	4	4 4 4 4 3 2 --	4 4 4 2 ±	4 4 4 4 3 --
66	4	4	4	4	Pos	Pos	4	4 4 4 4 3 2 1 -	3 4 4 3 ±	4 4 4 4 4 --
74	4	4	4	4	Pos	Pos	4	4 4 4 4 4 2 --	3 3 4 4 ±	4 4 4 4 1 --
86	4	4	4	4	Dbt	Pos	4	4 4 4 3 2 --	4 4 ±	4 4 4 4 1 --
93	4	4	4	4	..	Pos	4	4 4 4 4 3 1 --	4 4 4 3 ±	4 4 4 4 4 ±
109	4	4	4	4	Pos	Pos	4	4 4 4 4 3 1 --	4 4 4 4 2 --	4 4 4 4 4 4 ±

Pattern displayed by patient with early syphilis in which the therapy failed to influence the serologic picture.

months following treatment. A second patient displayed a well defined serorelapse after an initial favorable serologic trend for one hundred and twelve days after treatment. An additional member of the group experienced a clinical relapse after eighty-four days of practically unchanged high titer positive serologic reactions. Two patients who have displayed a progressive but protracted trend toward reversal cannot be readily classified

phase of the disease at the time of treatment, 11 have progressed to seronegativity or have displayed a consistently satisfactory trend in that direction. Four patients have shown a distinct tendency toward a recurrence of high titer reactions and must be classed as serologic relapses or as treatment failures. Two additional patients are looked on as probable failures and 5 are displaying a serologic trend which, although

favorable at the moment, displays a protracted decline which presages an unfavorable outcome.

The remaining tables represent serologic patterns which are considered to be representative of groups of patients.

COMMENT

The contrast which is displayed in the groups of treated patients rather indicates that (1) very early infections respond in the most favorable manner and (2) the increase in probable failures in patients with secondary syphilis indicates the need of a more vigorous therapy than that used in this study.

In evaluating the effectiveness of arsenic therapy in syphilis and of sulfonamide therapy in gonorrhea, it has been noted that a certain proportion of individuals fail to experience the same curative response which may be demonstrable in the majority of patients. A similar characteristic seems to be emerging in penicillin therapy of syphilis.

A majority of patients with early syphilis appear to respond to treatment in a satisfactory manner, as judged by the clinical course and the trend of the serologic reactions. A small group in the present series (7 definitely and 2 probably) appear to have derived a minimum of permanent benefit and must be considered as treatment failures.

In sulfonamide therapy of gonorrhea, failures of this type are classed as sulfonamide resistant and much has been written in regard to the drug resistance of strains of *Neisseria gonorrhoeae*. While accepting as possible that strain characteristics may play a role in determining the effectiveness of a therapy, it is felt that certain host factors are largely responsible for determining whether or not an agent, as penicillin, will be effective in infections which are amenable, as a rule, to treatment. It is felt that one of the most important problems in chemotherapy is a delineation of this essential factor and the development of means through which it may be favorably influenced.

In all the patients who have been classed as failures an observation period in excess of eighty-four days was required before an adverse decision as to treatment status was considered warranted. The data in these instances and in those which may occur among patients treated in the future will be scrutinized in an effort to determine a reliable basis for a more prompt decision predicated on clinical response and serologic pattern.

The making available of a pure or reasonably pure penicillin might effect a distinct change in the treatment picture both as to results produced and as to the duration of treatment, dosage and the interval between injections. Equally important will be the development of an assay method which gives assurance that the spirochetal activity of a product is consistently proportional to the antibacterial activity on which the present Oxford unit is based.

CONCLUSION

It is desired to recall that the disease syphilis is one which is characterized by chronicity, with long periods of latency and a distinct tendency to clinical and serologic recurrence. The evaluation of any therapy will require a prolonged trial utilizing a wide variety of treatment schedules and a carefully controlled follow-up system. The combined experience available at this time has served to illuminate only a few of the important aspects. The remainder must await the passage of time.

THE TREATMENT OF EARLY SYPHILIS WITH PENICILLIN

A PRELIMINARY REPORT OF 1,418 CASES

JOSEPH EARLE MOORE, M.D.

BALTIMORE

J. F. MAHONEY, M.D.

Medical Director, U. S. Public Health Service
STAPLETON, STATEN ISLAND, N. Y.

COMMANDER WALTER SCHWARTZ (MC), U.S.N.

LIEUTENANT COLONEL THOMAS STERNBERG

MEDICAL CORPS, ARMY OF THE UNITED STATES

AND

W. BARRY WOOD, M.D.

ST. LOUIS

In December 1943 Mahoney, Arnold and Harris¹ reported briefly on the effect of penicillin in experimental syphilis of rabbits and in 4 human patients with seropositive primary syphilis. As a result of these observations and of further experimental studies carried out in the laboratories of Mahoney² and Eagle³ there was organized, about Sept. 1, 1943, under the general auspices of the Committee on Medical Research of the Office of Scientific Research and Development and under the specific direction of the Subcommittee on Venereal Diseases, National Research Council, a cooperative study of the effect of penicillin in syphilis in human beings. A Penicillin Panel was appointed by this subcommittee, with membership including the authors of this paper.⁴ Because of the special problems confronting the armed forces, particular emphasis has been laid on early syphilis and on neurosyphilis, though other forms of late syphilis have also been studied. The preliminary results obtained to date are here presented in two papers, this dealing with early syphilis; the other, with Stokes as spokesman for the group, with late syphilis.

The penicillin employed has been derived from Army, Navy, Public Health Service, and Office of Scientific Research and Development sources. Only the sodium salt has been employed in these studies. Penicillin allocated to the Office of Scientific Research and Development for research purposes has been distributed by the Committee on Chemotherapeutic and Other Agents, National Research Council, Dr. Chester Keefer, chairman. This committee has allocated gradually increasing amounts of the drug to the Subcommittee on Venereal Diseases, which in turn has apportioned it among those civilian clinics selected for participation in the study.

Early syphilis is at present under investigation in twenty-three clinics or research centers. These, with the names of the responsible investigators, are as follows: U. S. Army (Fort Bragg, North Carolina, Capt. William Leifer, Camp Howze, Texas, Major Franklin Grauer), U. S. Navy (Naval Medical Center, Bethesda, Md., Lieut. Comdr. E. C. Barksdale), United

The authors are members of the Penicillin Panel of the Subcommittee on Venereal Diseases, National Research Council.

The work described in this paper was done under several contracts recommended by the Committee on Medical Research of the Office of Scientific Research and Development.

Read in a panel discussion on "Penicillin in the Treatment of Syphilis" before the Section on Dermatology and Syphilology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Mahoney, J. F.; Arnold, D. C., and Harris, A.: *Penicillin Treatment of Early Syphilis: A Preliminary Report*, Ven. Dis. Inform. 2:4:355, 1943.

2. Mahoney, J. F., and others: Unpublished data.

3. Eagle, H.: Unpublished data.

4. Dr. J. R. Heller Jr., medical director in charge Venereal Disease Division, United States Public Health Service, was later added to the membership of the panel.

States Public Health Service (Marine Hospital, Stapleton, S. I., Dr. J. F. Mahoney), Massachusetts Memorial Hospital, Boston (Dr. Oscar Cox), Bellevue Hospital, New York (Dr. Evan Thomas), Chicago Intensive Treatment Center (Dr. S. W. Becker), Cleveland City Hospital and University Hospitals (Dr. Harold Cole), University of Pennsylvania Hospital (Dr. J. H. Stokes), University of Texas (Dr. Chester Frazier), Washington University, St. Louis (Dr. W. Barry Wood Jr.), Yale University (Dr. Francis Blake), Dallas Venereal Disease Clinic (Dr. Arthur Schoch), Leland Stanford Jr. University Hospital (Dr. C. W. Barnett), Duke University Hospital (Dr. C. L. Callo-way), Vanderbilt University Hospital (Dr. R. H. Kampmeier), Johns Hopkins Hospital (Drs. J. E.

uniform manner. The immediate results of treatment were to be reported to the Penicillin Panel on specially devised forms (figs. 1 and 2), susceptible of coding, punch carding, and machine statistical analysis.

TABLE 1.—Four Treatment Schedules

Duration of Treatment	Interval Between Injections	Route of Administration	Single Dose	No. of Injections	Total Dose
7½ days	3 hours	Intramuscular	1,000 units	60	60,000 units
7½ days	3 hours	Intramuscular	5,000 units	60	300,000 units
7½ days	3 hours	Intramuscular	10,000 units	60	600,000 units
7½ days	3 hours	Intramuscular	20,000 units	60	1,200,000 units

On the basis of the very preliminary studies of Mahoney and his associates, there appeared to be five variables requiring study. These were (1) the route of administration, originally chosen¹ as intramuscular for the sake of slightly delayed absorption and excretion as compared to the intravenous route; (2) the interval between injections, at first selected¹ as every three hours day and night on the basis of known data as to the rate of absorption and excretion; (3) the duration of treatment, originally arbitrarily selected as eight days;¹ (4) the total dosage, again arbitrarily selected as 1,200,000 units,¹ and (5) possible combinations of penicillin with other drugs, e. g. mapharsen.

At the outset it was decided by the Penicillin Panel to hold the first three of these variables constant; i. e., all cases were to be treated by the intramuscular route every three hours day and night to a total of sixty injections given in seven and one-half days. The first effort was to be to define the minimum effective dose so given within this time period. Four treatment schedules were accordingly drawn up (table 1).

These covered a twenty fold dosage range up to and including the original maximum arbitrarily chosen by Mahoney and his co-workers. In addition there were originally planned (but subsequently temporarily dropped) two other groups, to test the combined effect of penicillin plus mapharsen. These two groups comprised a total penicillin dosage of 60,000 and 300,000 units respectively plus a total of 320 mg. of mapharsen given in eight divided doses of 40 mg. each daily for eight days. This mapharsen dosage was deliberately selected as a relatively safe and known subcurative dose from which a high rate of relapse might be expected.

Later, as material accumulated, the variable of time was brought under study, and three additional treatment groups were established with a total dosage of penicillin of 300,000, 600,000 and 1,200,000 units respectively given in thirty intramuscular injections every three hours day and night over a four day period. The latter groups have been so recently started as not

TABLE 2.—Duration of Follow-Up from Start of Treatment in 1,418 Patients with Early Syphilis (June 1, 1944)

Duration of Follow-Up, Weeks	No. of Patients Followed
1 to 4.....	671
5 to 8.....	207
9 to 16.....	227
17 to 24.....	107
25 to 48.....	6

to justify consideration in this paper, which is devoted entirely to the eight day treatment schedule. The only exception to the statement lies in 25 cases treated by the intravenous route before the present organized study began; in them the dosage was variable and the duration of treatment four to eight days.

FORM A
PENICILLIN THERAPY STUDY—EARLY SYPHILIS
IDENTIFICATION

Line No. 1 Study No. Adm Date

Line No. 2 Clinic Name Clinic Hist. No

Line No. 3 Race Sex Age Wt (kg) Diag

Line No. 4 Chancres Pres Abs No data Dkt Pos Neg Not done

Line No. 5 Duration of disease (days) Prev Px

Line No. 6 Skin lesions—Type Dkt Pos Neg ND

Line No. 7 Mucous membrane

Line No. 8

Line No. 9 Date Technic employed Quantitative titer (units)

Line No. 10 Spinal Fluid (Pre-Rx) Total Prot Colloidal Gold (Mastix) Date Cells Comp Fix (technique) (result)

Line No. 11 Other

Line No. 12 Penicillin Manufacturer Lot No. Check this square if irregularity in Px schedule occurs ☐ IS

Line No. 13 Route of administration (if other than IM) IV * * * * IV drip SC IS

Line No. 14 Penicillin date started Mapharsen date started

Line No. 15 Units per inj Mgm per inj Tot. no inj

Line No. 16 Int. between injections Int. between doses

Line No. 17 No injections per day No injections total Duration Maph Rx (days) Total Drug

Line No. 18 Duration Px (days) Herchemer (type & grade) Other reactions (type & severity)

Line No. 19 Total drug Herchemer (type & grade) Other reactions (type & severity)

Line No. 20 Dosage time T. Pal (hours) Remarks (note effect of penicillin if any on associated disease venereal or other)

Line No. 21 Lesions at end of Rx (check one) healed healing No response

Line No. 22 Other Rx if any

Fig. 1.—Obverse of form for reporting early syphilis by participating clinics.

Moore and C. F. Mohr), Tulane University (Dr. R. V. Platou), Presbyterian Hospital, New York (Dr. A. B. Cannon), University of Virginia Hospital (Dr. D. C. Smith), New York Hospital (Dr. Walsh McDermott) and the Detroit Health Department (Dr. Loren Shaffer). This report is based on the work of these investigators and of many of their associates and assistants, too numerous to name.⁵

These clinics and centers agreed (1) to treat patients with early syphilis on assigned treatment schedules in an effort to define as promptly as possible the all important time-dose relationship and (2) to pool their results under the Penicillin Panel of the Subcommittee on Venereal Diseases. Only those patients in whom the diagnosis of early syphilis was indubitable, on the basis of actual demonstration of treponemes, were to be acceptable. All patients were to be originally examined and subsequently followed in as nearly as possible a

5. The statistical data have been prepared by Miss Gwendolyn Fletcher.

For the purposes of this report, the books of the Penicillin Panel have been temporarily closed as of May 25, 1944. To that date there had been received 1,587 case reports of early syphilis, of which 1,418 were suitable for analysis as to various points. Of these 177 had seronegative primary, 379 seropositive primary, 698 uncomplicated and 67 complicated⁶ early secondary syphilis and 97 various types of recurrent (usually previously treated) secondary syphilis. Of the patients 461 were white, 950 Negro and 7 of other races; 791 were male and 627 female, of whom 58 were pregnant at the time of treatment.

The preliminary nature of this report is indicated by table 2, in which the duration of follow-up after treatment is shown. The majority of patients have so far been observed for less than two months; only 113 of the entire number for four months or longer. This fact must be repeatedly emphasized as a matter of caution; the results here presented are subject to major revision after further observation. It is planned to report further information as it develops at three to six month intervals.

THE IMMEDIATE RESULTS OF TREATMENT

Disappearance Time of Treponema Pallidum from Open Lesions.—Data are available on this point from 663 cases treated with penicillin alone (excluding those cases treated with penicillin plus mapharsen).

Regardless of the single or total dose of penicillin, organisms have promptly disappeared from open lesions in every case within a range of six to sixty hours. At the two extremes of dosage, 1,000 and 40,000 units, the average disappearance time varied only from twenty-one to fourteen hours. Whether the apparent trend toward shortening of disappearance time is significant is open to question because of the varying intervals at which dark field examinations were done in the several clinics. Not shown in the table is the fact that the intravenous holds no advantage over the intramuscular route in this respect.

Healing of Lesions.—This is difficult to measure in statistical terms. There has been no observed instance of failure of lesions to heal, regardless of the single or total dose. With a total dosage of 60,000 units in eight days, healing is less prompt than with arsenical therapy; with larger total dosage, 300,000 units and up, it is as rapid as with standard chemotherapy or more so.

Serologic Response.—In figure 3 is shown the median blood serologic response,⁷ in terms of quantitative titer, of four groups of patients treated with penicillin alone (excluding those treated with penicillin plus mapharsen). Included are both seropositive primary and secondary syphilis. Regardless of the total dosage, whether 60,000, 300,000, 600,000 or 1,200,000 units, there is apparent a trend toward serologic reversal within a period of about twenty days after the start of treatment. Within the range of 300,000 to 1,200,000 units this trend is approximately uniform, regardless of

dosage; with 60,000 units it is a little slower and less pronounced. Parenthetically, this rate of serologic reversal is identical with that observed after arsenical chemotherapy, whether with an arsphenamine at weekly

TABLE 3.—Average Disappearance Time of *Treponema Pallidum* from Open Lesions of Early Syphilis After Varying Treatment Schedules (June 1, 1944)

Size of Individual Dose Given Every Three Hours, Units	Cases	Average Disappearance Time of <i>Treponema Pallidum</i> , Hours
1,000	52	21
5,000	201	20
10,000	237	19
20,000	135	13
40,000	38	14

intervals or mapharsen given by various intensive methods.

Further data are shown in tables 4 and 5. In table 4 is summarized the blood serologic response of 48

Follow up Observation (not to be filled in by clinic)

NAME	No.	Obs. Period Days after start of Rx	Clinical Status	STS (technique employed)	units Quant. titer	
	1	0-7				
	2	8-14				
	3	15-21				
	4	22-28				
	5	29-42				
	6	43-56				
	7	57-84				
	8	85-112				
	9	113-140				
	10	141-168				
	11	169-224				
	12	225-280				
	13	281-336				
	14	337-392				
	15	393-456				
	16	457-560				
	17	561				
Final Classification		Time required from onset of treatment to seronegativity (first) (permanent)				
Final outcome pregnancy —		Cerebro-spinal Fluid (Follow up examination)				
Delivery (days after start of Rx)	Date	Cells	Tot. Prot. mm.	Complement fixation (smallest amt. giving pos. result)	Colloidal	Other
	1					
Clinical and serologic status child —	2					
	3					
	4					
	5					
	6					

Fig. 2.—Reverse of form for reporting early syphilis by participating clinics.

patients with seronegative primary syphilis observed for nine or more weeks after the start of treatment. These are not broken down by total dosage since, regardless of the range of 60,000 to 1,200,000 units, the response was identical. In 28 patients the serologic test for syphilis, originally negative, remained so

TABLE 4.—Blood Serologic Response in Seronegative Primary Syphilis, Patients Followed More Than Nine Weeks from Start of Treatment, All Treatment Schedules Combined (June 1, 1944)

Cases Followed	Serologic Test for Syphilis		
	Negative, Remained Negative	Negative, Became Positive, Later Negative	Serologic Relapse
48	28	18	2

throughout the period of observation; in 18 it became temporarily positive, then reverted to negative, and in 2 only there was a subsequent serologic relapse. From the serologic standpoint, therefore, and during the very brief observation period so far available, the results may be said to be satisfactory in 95.8 per cent of the cases.

6. Complicated by asymptomatic neurosyphilis, syphilitic meningitis or ocular, osseous or visceral lesions.
7. This has been determined by a statistical device which assigns to the initial quantitative titer, regardless of the actual number of units, the numerical value of 100. All subsequent observations are expressed in terms of per cent of the original titer.

In seropositive early syphilis (combining seropositive primary and secondary syphilis) the results, now broken down by treatment schedule, are shown in table 5 (limited to patients observed for nine or more weeks after the start of treatment). Here there is a direct relationship between "satisfactory" and "unsatisfactory" immediate serologic results and total dosage of penicillin; the larger the dose, the better the result. The only and perhaps a major exception to this is in the group of patients who received 300,000 units of penicillin plus 320 mg. of mapharsen in seven and one-half days. This group shows as good initial results as were shown by patients receiving four times as much penicillin without mapharsen.

So far it is clear that the minimum effective dose of penicillin in early syphilis in man cannot be determined on the bases of disappearance time of surface organisms, healing of lesions or (except very roughly) serologic

relapse or apparently reinfection, has been classified as clinical relapse. Serologic relapse includes not only those who, originally seronegative or rendered so by treatment, subsequently became seropositive but also those who, still seropositive in low titer, subsequently develop high titer tests.⁸ An effort has been made to

TABLE 6.—Incidence of Relapse in Seronegative Primary Syphilis Treated by Varying Schedules in Eight Days, Patients Observed for More Than Thirty-Eight Days (June 1, 1944)

Treatment Schedule, Total Dose, Units	Cases Followed	Relapse			%
		Clinical	Serologic	Total Number	
60,000.....	12	..	..	..	..
200,000.....	14	1	..	1	7.1
300,000.....	21	1	1	2	9.5
600,000.....	52	..	..	..	..
1,200,000.....	4	..	..	..	..
Intravenous (see text).....	4	..	..	..	..
Total.....	92	2	1	3	3.2

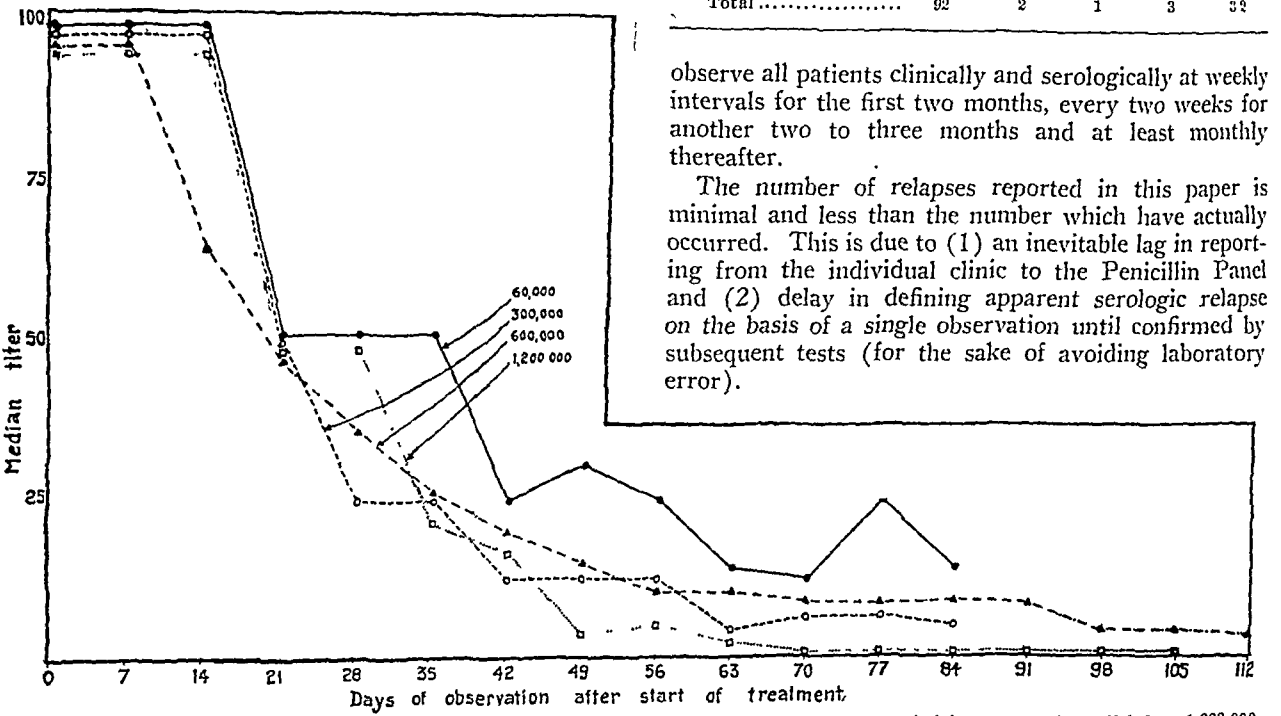


Fig. 3.—Median serologic response of seropositive early syphilis to penicillin with four treatment schedules ranging from 60,000 to 1,200,000 units total dose in eight days; June 1, 1944.

response since, regardless of total dose, within the range employed the drug is effective in all of these respects. The only available criterion lies, therefore, in the incidence of relapse.

TABLE 5.—Blood Serologic Response in Seropositive Early Syphilis According to Treatment Schedule, Patients Followed More Than Nine Weeks from Start of Treatment (June 1, 1944)

Treatment Schedule, Units	Cases Followed	Serologic Test for Syphilis Response	
		Satisfactory (Reversed, or Titer Falling), %	Unsatisfactory (No Significant Change, or Relapse), %
60,000.....	38	57.8	42.1
60,000 + mapharsen.....	26	76.9	23.0
300,000.....	79	82.1	17.7
300,000 + mapharsen.....	24	91.6	8.3
600,000.....	109	88.0	12.0
1,200,000.....	62	90.3	9.6

Relapse After Penicillin Treatment.—In this material, relapse has been rigidly defined. Any subsequent clinical manifestation of the disease, whether obviously

observe all patients clinically and serologically at weekly intervals for the first two months, every two weeks for another two to three months and at least monthly thereafter.

The number of relapses reported in this paper is minimal and less than the number which have actually occurred. This is due to (1) an inevitable lag in reporting from the individual clinic to the Penicillin Panel and (2) delay in defining apparent serologic relapse on the basis of a single observation until confirmed by subsequent tests (for the sake of avoiding laboratory error).

The method of statistical reporting here adopted is recognizedly inaccurate in that the incidence of relapse is related to the total number of patients observed for a period of time greater than that of the earliest observed relapse. In the tables to follow all patients are included who were observed for thirty-eight days or longer after the start of treatment, since this was the shortest interval at which relapse was observed. The brief interval available for study prevents the adoption of the statistical method used by Eagle,⁹ which will, however, be utilized in later more definitive analyses. Preliminary rough test of this method of appraisal suggests that the eventual incidence of relapse will probably be from four to five times as great as that reported here. In table 6 is shown the incidence of relapse, clinical and serologic, in 92 patients with sero-

8. Not yet classified as relapse or "unsatisfactory result" are those patients whose serologic tests have shown no improvement. Twelve months after treatment will be allowed to elapse before such patients are classified as seroresistant.
9. Eagle, H.: The Treatment of Early and Latent Syphilis in Nine to Twelve Weeks with Triweekly Injections of Mapharsen: A Preliminary Analysis of the First 4,823 Cases, to be published

negative primary syphilis. The numbers, broken down by treatment schedule, are too small to be significant, though the total observed relapse rate, 3.2 per cent, is low.

Similar data for seropositive primary syphilis are shown in table 7 and for secondary syphilis in table 8.

TABLE 7.—Incidence of Relapse in Seropositive Primary Syphilis, Treated by Varying Schedules in Eight Days, Patients Observed for More Than Thirty-Eight Days (June 1, 1944)

Treatment Schedule, Total Dose, Units	Cases Followed	Relapse			%
		Clinical	Serologic	Total Number	
60,000.....	8	2	..	2	25.0
300,000.....	3	..	..	..	...
600,000.....	30	2	1	3	10.0
1,200,000.....	37	..	..	..	...
1,200,000.....	75	1	1	2	2.6
Intravenous (see text).....	5	1	..	1	20.0
Total.....	153	6	2	8	5.0

TABLE 8.—Incidence of Relapse in Secondary Syphilis Treated by Varying Schedules in Eight Days, Patients Followed for More Than Thirty-Eight Days (June 1, 1944)

Treatment Schedule, Total Dose, Units	Cases Followed	Relapse			%
		Clinical	Serologic	Total Number	
60,000.....	37	9	2	11	29.6
300,000.....	8	3	..	2	37.5
600,000.....	94	6	4	10	10.6
1,200,000.....	136	4	3	7	5.0
1,200,000.....	64	..	2	2	3.1
Intravenous (see text).....	16	1	1	2	12.5
Total.....	355	23	12	35	9.8

These relate to patients treated with penicillin alone (excluding the combined penicillin with mapharsen groups). Here there is obvious a direct correlation between total dose and relapse incidence.

The data of tables 6, 7 and 8 are combined in table 9 for all patients with early syphilis; and here is added information concerning the patients treated with penicillin plus 320 mg. of mapharsen (two groups, 60,000 and 300,000 units respectively) and also concerning a small group of patients (25 in number) treated by the intravenous route before the present organized study was begun. In patients treated with penicillin by the intramuscular route the incidence of relapse, even in the brief observation period available, is in direct proportion to total dosage (nearly 30 per cent with 60,000 units, only 2 per cent with 1,200,000 units). In the small group who received large doses intravenously, ranging from 600,000 to 1,200,000 units, and whether by multiple injections or continuous drip, the observed relapses are five to six times as great as in patients treated with comparable doses by the intramuscular route, suggesting that the intravenous route not only holds no advantage over the intramuscular route but is actually less effective.

In table 10 the incidence of relapse is related to the stage of disease at the start of treatment in patients treated with penicillin alone (omitting the groups combined with mapharsen, among which only 1 relapse has so far occurred) and without regard to total dosage. In conformity with Eagle's report⁹ as to semi-intensive arsenotherapy, and in contrast to the older Cooperative Clinical Group and other data¹⁰ as to "standard" prolonged arsenical chemotherapy, there seems to be here a direct relationship between the stage of the disease at

the time of starting treatment and the incidence of relapse. The proportions in patients treated with penicillin alone are 3.2 per cent for seronegative primary, 5.0 per cent for seropositive primary and nearly 10 per cent for early secondary syphilis.

Table 11 shows the average and extreme intervals between the start of treatment and observed relapse. Here there is no direct correlation as to total dose. Relapses have occurred as early as thirty-eight days and as late as two hundred and ninety-four days after the start of treatment. Considering the short periods of observation so far available for all groups treated, further relapses in all may be confidently anticipated.

The Optimum Time-Dose Relationship for Penicillin in Early Syphilis.—The available data indicate that within the twentyfold dosage range employed in a period of seven and one-half days penicillin has a profound immediate effect in terms of disappearance of surface organisms, healing of lesions and serologic reversal. In seronegative primary syphilis no statements as to minimum effective dose are as yet justifiable. In seropositive primary and early secondary syphilis any dose less than 600,000 units in seven and one-half days is clearly ineffective. A total dose of 600,000 units provides a minimum relapse rate of nearly 5 per cent, of 1,200,000 units a rate of 2 per cent, within the short period for which such patients have so far been followed. The intravenous route appears to be less effective, even in large doses, than the intramuscular.

The possibility that even 1,200,000 units in a four to eight day period will prove to be inefficacious after further observation has led the Penicillin Panel to inaugurate the study of two additional treatment groups

TABLE 9.—Incidence of Relapse in All Types of Early Syphilis Treated by Varying Schedules, Patients Observed for More Than Thirty-Eight Days (June 1, 1944)

Treatment Schedule, Total Dose, Units (Route Intramuscular Unless Specified)	Cases Followed	Relapse			
		Clinical	Serologic	Total Number	%
60,000.....	46	11	2	13	28.2
60,000 + 320 mg. mapharsen.....	26	..	..	..	...
200,000.....	11	3	..	3	27.2
300,000.....	133	9	5	14	10.1
300,000 + 320 mg. mapharsen.....	63	1	..	1	1.4
600,000.....	194	5	4	9	4.6
1,200,000.....	191	1	3	4	2.0
Various intravenous schedules *.....	25	2	1	3	12.0

* Dosage range 600,000 to 1,200,000 (all but 3 cases 1 million +), single intravenous injections, intravenous drip or both, in 4 to 8 days.

TABLE 10.—Incidence of Relapse by Stage of Disease, All Treatment Schedules * Combined, Patients Followed More Than Thirty-Eight Days (June 1, 1944)

Stage of Disease	Cases Followed	Relapse			%
		Clinical	Serologic	Total Number	
Primary seronegative.....	92	2	1	3	3.2
Primary seropositive.....	159	6	2	8	5.0
Secondary.....	355	23	12	35	9.8

* Omitting 94 patients treated with penicillin + mapharsen.

given a total of 2,400,000 units in thirty and sixty intramuscular injections in four and seven and one-half days respectively. These patients are being treated in the United States Army and eight selected United States Public Health Service rapid treatment centers.

The results obtained to date in the two small groups of patients given 60,000 and 300,000 units of penicillin respectively, in each case plus the known subcurative

10. Stokes, J. H., and others: Cooperative Clinical Studies in the Treatment of Syphilis: Early Syphilis, Ven. Dis. Inform. 13:165, 207 and 253, 1932.

total dose of 320 mg. of mapharsen in eight days, are worth emphasizing. In 94 such patients followed for thirty-eight days or more only one relapse has occurred. It is perhaps to be expected that certain patients with early syphilis will prove to be resistant to penicillin exactly as a relatively standard proportion of 5 to 15 per cent of patients has proved to be resistant to arsenic heavy metal chemotherapy. But, in view of what is already known concerning the probable modes of action of penicillin and of arsenic and bismuth in syphilis (considerations too lengthy for discussion here) it is possible that those patients resistant to penicillin will not be the same ones resistant to metal chemotherapy and that a combination of the two forms of treatment will eventually prove to be more effective than any method of use of either one alone.

It should also be emphasized that penicillin, as so far employed in early syphilis, is not suitable for mass application. Injections every three hours day and night over whatever period of time demand hospitalization and trained nursing or professional care. However available these may be for the armed forces, facilities are inadequate in civilian practice to meet the enormous demand. The eventual general use of the drug depends

TABLE 11.—Average and Extreme Intervals from Start of Treatment to Relapse According to Treatment Schedule (June 1, 1944)

Treatment Schedule, Units	Average Interval, Days	Extreme Intervals, Days
60,000.....	104	64 to 154
60,000 + mapharsen.....	No relapses observed	
200,000.....	116	83 to 135
300,000.....	90	38 to 166
300,000 + mapharsen.....	..	53*
600,000.....	98	73 to 113
1,200,000.....	132	63 to 294
Intravenous.....	74	56 to 126

* One relapse only.

on the development of methods which will permit its administration on an ambulatory basis.

As with arsenical chemotherapy, it is probable that the optimum time-dose relationship for the treatment of early syphilis in man with penicillin alone and its relative efficacy when administered alone or in combination with other forms of treatment will be guided by data from the experimental laboratory not as yet available but shortly to be expected.

In man, further immediate studies should be directed to (1) determination of the relative effectiveness of 1,200,000 units versus much larger doses in four and eight days respectively, (2) variation of the time interval between individual dosage within the range of three to twenty-four hours, (3) more exact definition of the merits of intravenous versus intramuscular administration and (4) an expansion of the combinations penicillin plus arsenic and penicillin plus bismuth.

Results of Treatment of Special Forms of Early Syphilis.—Thirteen patients with early syphilis in this series had positive spinal fluids before treatment (11 of them group 2, 2 group 3). Of these, the fluid abnormalities disappeared or improved under penicillin treatment alone in 10 within time period ranging from ten to fifty days; 3 were unimproved.

Acute Syphilitic Meningitis.—Ten patients with this complication of early syphilis have been treated, the majority with 1,200,000 units in seven and one-half days. Symptomatic relief has been dramatically prompt in all and, in the majority, spinal fluid abnormalities have disappeared or are rapidly improving.

Treatment Resistant Early Syphilis.—Eight patients, most of them with dark field positive psoriasiform syphilids, persisting in spite of or recurring during metal chemotherapy, have been treated with penicillin, with prompt healing in all and with subsequent serologic behavior similar to that of previously untreated early syphilis.

Infantile Congenital Syphilis.—Not included in the tabular presentations are some 20 infants with early congenital syphilis. The majority of them have been treated with a total dose of penicillin of 20,000 units per kilogram of body weight, corresponding to a total dose of 1,200,000 units in the adult. Their behavior in terms of symptomatic improvement and serologic response is analogous to that of early acquired syphilis in the adult.

The Outcome of Pregnancy.—Though 58 pregnant women with early syphilis have so far been treated, it is too early to speak of any results as to the outcome in the child.

REACTIONS TO PENICILLIN

Herxheimer Reactions.—Of 1,418 patients treated, 846 (59 per cent) have had Herxheimer reactions within the first twenty-four hours. This consists usually of fever alone (685 cases); in the others, exacerbation of secondary skin lesions with or without fever. The fever is usually mild (less than 102 F.), though in 174 cases (12 per cent) the febrile rise has been higher than this level. In no case has the reaction been alarming, nor has it interfered with subsequent treatment.

Other Reactions.—Only 59 patients (41 per cent of the total treated) have had other reactions attributable to penicillin. In 15 there were cutaneous eruptions (8 urticaria, 7 other types of skin rashes, none severe). Seven had mild gastrointestinal reactions, 33 secondary fever, 2 abscessed buttocks and 2 miscellaneous mild disturbances. In no case has penicillin treatment had to be suspended because of reactions from the drug.

SUMMARY

1. An organized study of the effect of penicillin in early syphilis is in progress in an effort to determine the optimum method of use of the drug. The results so far available are preliminary.

2. Penicillin has a profound immediate effect in early syphilis in terms of (a) disappearance of surface organisms from open lesions, (b) healing of lesions and (c) a trend toward serologic reversal.

3. These immediate effects are in general identical within a twentyfold dosage range of 60,000 to 1,200,000 units administered by the intramuscular route every three hours day and night to a total of sixty injections in seven and one-half days.

4. The same immediate effects are apparent within the dosage range of 300,000 to 1,200,000 units given by the intramuscular route every three hours day and night to a total of thirty injections in four days.

5. These immediate effects cannot be utilized to determine the optimum time-dose relationship, which, in man, depends on the incidence of relapse.

6. The incidence of relapse, when penicillin is administered alone, is in direct relationship to the total dosage given by the intramuscular route in a seven and one-half day period, greatest with 60,000 units and least with 1,200,000 units.

7. Relapse appears to be more frequent after intravenous than after intramuscular administration of comparable doses.

8. The lowest incidence of relapse—and the most favorable serologic response—was in small groups of patients treated with 60,000 and 300,000 units respectively of penicillin plus a known subcurative dose of mapharsen.

9. Penicillin has a favorable effect in early asymptomatic neurosyphilis, acute syphilitic meningitis, early syphilis treatment resistant to arsenic and bismuth and infantile congenital syphilis.

10. No opinion can be as yet expressed as to the effect of penicillin in the prevention of prenatal syphilis.

11. The optimum time-dose relationship of penicillin in early syphilis is not yet established. Certainly the minimum dose, especially in secondary syphilis, should not be less than 1,200,000 units; probably it should be more.

12. Herxheimer reactions after the penicillin treatment of early syphilis are frequent but not serious; other reactions, due to penicillin itself, are negligible.

13. Further avenues of study are suggested.

THE ACTION OF PENICILLIN IN LATE SYPHILIS

INCLUDING NEUROSYPHILIS, BENIGN LATE SYPHILIS
AND LATE CONGENITAL SYPHILIS:
PRELIMINARY REPORT

JOHN H. STOKES, M.D.

PHILADELPHIA

LIEUTENANT COLONEL THOMAS H. STERNBERG
MEDICAL CORPS, ARMY OF THE UNITED STATES

COMMANDER WALTER H. SCHWARTZ (MC), U.S.N.

JOHN F. MAHONEY, M.D.

Senior Surgeon, U. S. Public Health Service
STAPLETON, STATEN ISLAND, N. Y.

J. E. MOORE, M.D.

BALTIMORE

AND

W. BARRY WOOD JR., M.D.

ST. LOUIS

These cases are drawn from eight clinics at present engaged in a study of the effect of penicillin on late syphilis, under the general auspices of the Committee on Medical Research of the office of Scientific Research and Development. These, with the names of the responsible investigators, are as follows: University of Pennsylvania (John H. Stokes, M.D.), Cornell University (Walsh McDermott, M.D.), Mayo Clinic (Paul A. O'Leary, M.D.), Boston Psychopathic Hospital (Harry P. Solomon, M.D.), University of Michigan (Udo J. Wile, M.D.), Bellevue Hospital (Evan Thomas, M.D.) and Johns Hopkins University (J. E. Moore, M.D.). Associated with each of them are various co-workers and assistants too numerous to mention here, but to whom due credit will subsequently be given.

Penicillin has distinctly beneficial serologic and clinical effects on neurosyphilis, including early and late manifestations, not excepting tabes and paresis, and including asymptomatic neurosyphilis. Its action on gummatous manifestations of skin, mucosae and bones

is so striking and complete that it seems unnecessary to collect further cases merely to demonstrate it as such. In ocular syphilis, simple inflammatory processes respond; later and more complicated lesions such as the optic neuritides and interstitial keratitis recover, relapse, present resistance and residues proportional to damage already done. This statement is probably true of visceral syphilis and of special localized processes and eighth nerve involvement.

These categorical statements are based on a material collected from 182 cases, observed for periods ranging from eight to two hundred and fourteen days after the institution of treatment. The preliminary conclusions are sharply limited by qualifications involving not only duration of observation and small numbers in individual breakdown items but by wide variation in time-dosage relationships and little uniformity as to time and type of test and recheck procedure. No precedents existing, each investigator groped his way into his problem. A considerable part of the material collected from nonuniform records was of such short observation and so "mixed" in therapeutic procedure that it furnished little evaluative worth. The distribution by source, duration of observation and diagnosis is given in table 1. Paresis, a crucial tester of therapeutic effect, heads the list (56 cases) and neurosyphilis totals 122 cases. Observation of sixty days or more was maintained in 44 Pennsylvania, 20 Johns Hopkins, 11 Mayo, 1 Bellevue, 5 New York Hospital and 1 Michigan case, a total of 82 cases.

Notwithstanding the limitations described, the material furnished the basis for demonstrating by both symptoms and laboratory tests (quantitative serologic, spinal fluid examination) the incontestable reality of the effect of penicillin treatment in syphilis. It permits an exploratory breakdown into grades of treatment effect as such, in relation to previous standard treatment; by at least two grades of intensity of penicillin treatment—low intensity (type A) 600,000 to 1,200,000 units of the sodium salt at 10,000 to 25,000 units intramuscularly every three to four hours and high intensity (type B) 2,400,000 to 4,000,000 units at 25,000 to 50,000 units intramuscularly every two to four hours. It was not possible from this material to estimate the difference in effect of hourly variations or unit dose variations, or of intravenous or intraspinal medication.

EFFECT OF PENICILLIN ON THE REAGIN TITER OF THE BLOOD

Irrespective of the system used and in all types of late (excluding latent) syphilis, penicillin causes improvement (reduction) of reagin titer in from about 50 to 60 per cent of 96 late cases in which such data were available (table 2). An initial Herxheimer-like rise or "provocative" effect is observable in about 20 per cent of late cases. Within the period of observation 10 per cent of late cases became completely negative.

In 5 cases of seroresistant syphilis, 1 became negative (low titer to start with) and 4 improved. Herxheimer effect occurred in 1.

In 32 cases of general paresis, disregarding treatment system employed, 16 were serologically improved, 2 reduced to negative.

EFFECT OF PENICILLIN ON THE SPINAL FLUID IN NEUROSYPHILIS

This furnishes probably the most graphic demonstration of the effect of penicillin, because of its multiple quantitative approach. Seven grades of change were

The authors are members of the Penicillin Panel of the Subcommittee on Venereal Diseases, National Research Council.

The work described in this paper was done under contract recommended by the Committee on Medical Research between the Office of Scientific Research and Development and several universities.

Read in a panel discussion on "Penicillin in the Treatment of Syphilis" before the Section on Dermatology and Syphilology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

considered: worse, no change and five grades of improvement as follows: grade 1, reduction in cell count or total protein; grade 2, reduction in both cell count and total protein; grade 3, reduction of cell count, total protein and intensity of colloidal test; grade 4,

TABLE 1.—*Penicillin Investigation: Late and Miscellaneous Syphilis; Distribution of Material by Source, Duration of Observation and Diagnosis*

Diagnosis	Immediate: Less Than 20 Days	Duration of Observation				Total Cases
		20-59 Days	60-99 Days	100-139 Days	140-214 Days	
Paresis and taboparesis.....	11	22	15	4	4	56
Tabes, including primary optic atrophy.....	6	8	5	2	1	22
Meningovascular neuro- syphilis.....	6	3	3	3	1	16
Asymptomatic neuro- syphilis.....	2	13	8	1	4	28
Benign late skin and bone	4	8	3	0	6	21
Interstitial keratitis.....	0	5	3	3	2	13
Iritis.....	0	2	1	0	1	4
Miscellaneous.....	4	6	5	6	1	22
Total.....						182
Clinic sources						
Bellevue.....	1	3	1	0	0	5
Boston.....	8	8	0	0	0	16
Johns Hopkins.....	9	23	10	2	8	52
Mayo.....	7	3	6	1	4	21
Michigan.....	6	2	1	0	0	9
New York Hospital....	1	10	5	0	0	16
Pennsylvania.....	1	18	20	16	8	63
Totals.....	33	67	43	19	20	182

reduction in cells and protein and in intensity of both colloidal and complement fixation tests; grade 5, return to normal.

In grouping improvements, grades 1 and 2 together were rated as slight, grades 3, 4 and 5 together as definite improvement. Improvement as a whole, however, included grades 2, 3, 4 and 5.

TABLE 2.—*Blood Serologic Response to Penicillin*

Type of Syphilis	Herxheimer or Provo- cative Effect	Improved But Not to Negative	Reduced to Negative	Improve- ment Temporary	No Change
Late (96 cases)	20	33	10	13	25

TABLE 3.—*Cerebrospinal Fluid Changes Following Penicillin in 107 Cases in Which Repeated Spinal Fluid Examinations Were Available at Some Time After Treatment*

Diagnosis	Slight Improvement		Definite Improvement			No Change	Worse
	Grade 1 Cells or Protein Reduced	Grade 2 Cells and Protein Reduced	Grade 3 Cells Protein Colloid Reduced	Grade 4 Cells Protein Colloid and Wasser- mann Reduced	Grade 5 Return to Normal		
Paresis and taboparesis (42 cases)....	6	19	4	4	0	5	4
Tabes and meningo- vascular (25 cases)....	4	2	4	7	0	5	3
Asympto- matic (40 cases)....	7	5	6	9	1	6	6
Total (107 cases)...	17	26	14	20	1	16	13

In a total of 107 cases which had had one or more spinal fluid examinations after completion of penicillin therapy, it appears that 78 cases showed some degree of improvement in spinal fluid findings, 43 slight and

35 definite. The commonest change is a reduction in cells and total protein, but grade 4 improvement is remarkably common, including all four items of the fluid examination. This response is, as would be expected, evident in a higher proportion (1/4) in asymptomatic neurosyphilis than in paresis (1/9). Some of the cases rated as "worse" are, we believe, to be regarded as Herxheimer or flare effects and would probably improve on longer observation. It is interesting that 4 asymptomatic cases accompanied by gummatous benign syphilis were among the 6 asymptomatic cases in which the condition became "worse."

In order to carry the specific touch of conviction to the doubter as to the effect of penicillin on the blood and spinal fluid, we reproduce here serial spinal fluid and blood observations of 6 patients, 3 with late con-

TABLE 4.—*Penicillin Treatment Series 1 in Case 3; Total Dose 1,200,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
0	16 units	29	0123	3 plus	4432210000
12	.....	12	0012	2 plus	2211000000
76	2	10	0112	1 plus	3211000000

TABLE 5.—*Penicillin Treatment Series 2 in Case 3; Total Additional Dose 1,200,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
104	16 units	11	0112	20 mg.	2211100000
161	Less than 1	5	0012	20 mg.	2211000000

TABLE 6.—*Penicillin Treatment Series 1 in Case 5; Total Dose 1,200,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
0	128 units	22	1241	4 plus	1332320000
19	16	8	1241	3 plus	4431160000
55	32	4	0012	Plus-minus	2221000000
86	64	3	0123	30	2221100000
111	61	1	0124	50	2211000000

genital syphilis and 3 with acquired neurosyphilis. It is notable that these effects were secured with low intensity (type A) treatment in all but 1 case.

CASE HISTORIES

CASE 3 (Pennsylvania).—A man aged 38, with acquired syphilis. Primary optic atrophy in tabes, with euphoria, possible taboparesis. Fields (fig. 2) showed sector defect suggesting arachnoiditic or retrobulbar neuritic episode. Original spinal fluid, cells 122, Kolmer Wassermann reaction 4444, Pandey 4 plus, mastic 4442110000, improved to cells 29, Kolmer Wassermann reaction 0123, Pandey 3 plus, mastic 4432210000 by two Swift-Ellis treatments. After the first series of treatments with penicillin (table 4) the patient began to lose ground visually, with slight confusion and increased euphoria. The second series of treatments (table 5) resulted in definite improvement in fields, acuity and mental state.

CASE 5 (Pennsylvania).—A man aged 24 with congenital syphilis with typical stigmas, asymptomatic neurosyphilis, previously treated with forty arsenical and forty bismuth injections, was given the treatment outlined in table 6. He was retreated twenty-eight days later with the results shown in table 7.

CASE 11 (Pennsylvania).—A man aged 18 with congenital syphilis discovered at age 6 and treated with thirty neosphenamine injections a year for eleven years showed typical stigmas, neurologic signs, including Argyll Robertson pupils, anisocoria, partial ptosis of the left eyelid, weakness of the left seventh nerve and sluggish reflexes. He was given the treatment outlined in table 8. The ptosis disappeared under penicillin.

CASE 8 (Pennsylvania).—A woman aged 41 with acquired asymptomatic neurosyphilis discovered in blood donation, without symptoms or previous treatment, was given penicillin with the results shown in table 9.

CASE 29 (Pennsylvania).—A woman aged 29 with acquired neurosyphilis experienced sudden diminution of vision, advanced primary optic atrophy. Previous treatment, 1935-1939, consisted of eighteen arsphenamine and thirty-six bismuth injections. Treatment with penicillin (table 10) resulted in no improvement in fields or acuity: right eye 20/400, left eye 20/300.

CASE 50 (Pennsylvania).—A man aged 25 with congenital syphilis, showing typical stigmas and asymptomatic neurosyphilis, had been treated with sixty-two injections of neo-

100 per cent, the last representing practically complete restoration to normality.

Of 56 cases of paresis and taboparesis, 10 presented no adequate classification data. Of the 46 remaining cases 30 were classified as simple demented, of which

TABLE 9.—*Penicillin Treatment Series 1 in Case 8; Total Dose 1,200,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
0	64 units	103	4444	4 plus	2444110000
17	8	29	1244	2 plus	2221100000
46	32	11	0012	1 plus	2211000000
74	32	6	0112	30	1111000000
102	32	6	0112	40	2211000000
129	8	4	0011	30	1111000000
159	32	8	0122	30	2211100000
178	16	6	0012	30	2221100000

TABLE 10.—*Penicillin Treatment Series 1 in Case 29; Total Dose 1,200,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
0	64 units	148	4444	30 mg.	3331100000
9	64	16	1244	30 mg.	2221100000
30	32	15	0012	30 mg.	2221000000
65	64	4	0122	20 mg.	1111000000
119	32	0	0011	20 mg.	1111000000

TABLE 7.—*Penicillin Retreatment Series 2 in Case 5; Total Additional Dose 1,200,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
139	61 units	2	0011	40	2211000000
164	64	4	0011	20	1110000000

TABLE 8.—*Penicillin Treatment Series 1 in Case 11; Total Dose 1,200,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
0	16 units	32	1244	4 plus	3332210000
13	4	16	0122	1 plus	2111000000
32	4	8	0011	Plus-mixus	2111000000
140	Less than 1	1	0000	30 mg.	1110000000

TABLE 11.—*Penicillin Treatment Series 1 in Case 50; Total Dose 1,200,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
0	16 units	96	4444	40 mg.	2455555421
8	Negative	21	4444	20 mg.	4443210000
36	32	12	0124	30 mg.	2221000000

arsphenamine and 102 injections of bismuth. Results of treatment with penicillin are shown in tables 11 and 12.

CASE 64 (Pennsylvania).—A man aged 37 with acquired syphilis, early paresis (?), showed sluggish pupils and lower cord reflexes and loss of memory. Previous treatment consisted of twenty-two mapharsen injections and nineteen bismuth injections.

SYMPTOMATIC RESULTS IN NEUROSYPHILIS

Since there is a well recognized disparity between symptomatic and serologic response in neurosyphilis, and the symptomatic often outweighs the serologic aspect in importance for the patient, symptomatic responses secured by penicillin in neurosyphilis were next examined. Here it is important to give warning of misinterpretations due to Herxheimer and possibly therapeutic paradoxical effects from overintense initial treatment. It is notable that some patients who did badly at the start improved later and that top notch symptomatic gains followed a low intensity system in some cases.

Penicillin also has a favorable effect in general paresis. Three groups were made up from the material (conceding the inadequacy from the psychiatric standpoint due to record deficiencies): simple demented paresis (grades 1, 2, 3); deteriorated paresis (grades 1, 2, 3); progressive paresis (galloping and so on) and symptomatic exacerbation suggesting Herxheimer effect. Improvement was graded 25, 50 and 75 and

TABLE 12.—*Penicillin Retreatment Series 2 in Case 50; Additional Dose 1,200,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
53	Negative	9	0112	30 mg.	2221100000
84	16 units	8	0000	20 mg.	1111000000

TABLE 13.—*Penicillin Treatment Series 1 in Case 64; Total Dose 2,850,000 Units*

After Penicillin, Days	Quantitative Kline (Blood)	Cerebrospinal Fluid			
		C. S. F. Wassermann (Kolmer)	Protein	Mastic	
0	Less than 1 unit	72	4444	40 mg.	3555210000
22	00	5	0011	20 mg.	1111000000
56	00	5	0012	20 mg.	1111000000

only 6 (20 per cent) failed to improve and 1 grew worse. Thirteen, or nearly half, improved 50 per cent or more, including 8 which improved 75 per cent and 1 restored symptomatically to normal. Ten cases improved only 25 per cent. As might be expected,

deteriorated cases (10) made less response, 1 improving 50 per cent, 2 75 per cent and 7 showing no change. The 1 patient with progressive or galloping paresis in Solomon's service died and 1 of Moore's simple demented patients died thirteen weeks after penicillin.

We know of no record of spontaneous remission under the good effects of hospitalization which can

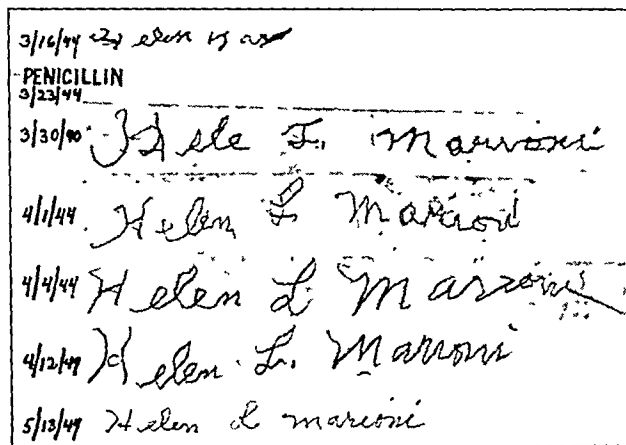


Fig. 1.—Improvement in handwriting of a simple demented parietic patient approximately six weeks after penicillin treatment. The signature before treatment is given above the word "penicillin" (courtesy of George D. Gammon, M.D.).

approach this. The transformations in orientation, speech, handwriting and encephalographic findings will be more fully presented from the University of Pennsylvania material in objective form by George D. Gammon, M.D., in a forthcoming paper. From the collected records, however, two brief summaries are given:

A white woman aged 34 with symptomatic paresis, grade 4 cerebrospinal fluid, could not write or do housework. She had auditory hallucinations, personality changes, disorientation, tremor of the tongue, hands and mouth, and slurred speech. On the second day of penicillin therapy she had a Herxheimer reaction with right-sided convulsions becoming generalized. After twenty-four hours penicillin was reinstituted at half dose to a total of 1,200,000 units without untoward effect. By the sixteenth day the patient was completely oriented, with memory, speech, tremor and electroencephalogram improved. In four months the patient was tremor free, speech and writing were normal (fig. 1), she was well oriented and hallucination free and was satisfactorily performing housework including marketing with points and driving a car. Clinical improvement was not accompanied by improvement in the spinal fluid.

A white man aged 42 with symptomatic paresis developed mispronouncing of words, garbled speech, uncertain gait, tremor of hands and difficulty in writing in August 1943, when a shell exploded near him. Forty-eight arm and hip injections were given. He became boastful, speech rambling and tremors were more pronounced; handwriting was worse and calculation poor. His condition was unimproved during hospitalization after 50,000 Oxford units per dose of penicillin to a total of 4,000,000 units. Clinical improvement occurred three weeks after penicillin with loss of tremors, improved handwriting and speech. He passed an examination as a pipe fitter. Improvement in the cerebrospinal fluid did not accompany clinical improvement. The neurologist considered him mentally improved but not to the original level.

Combining all types of clinically diagnosed paresis and taboparesis, exclusive of 10 patients treated with intraspinal or intravenous penicillin or malaria and thus totaling 46 cases, 15 failed to improve, 12 improved 25 per cent, 6 improved 50 per cent, 10 improved 75 per cent, 1 recovered and 2 died. Of 22 patients with tabes dorsalis, 14 presented data sufficient for interpretation, including 7 with primary optic atrophy and

3 with lightning pains of unusual severity plus 4 taboparetic patients with lightning pains who were grouped together with respect to this symptom. Of the 14 tabetic patients 3 improved to the extent of 50 per cent or more, and 2 of them with lightning pains were relieved completely. Eleven tabetic patients showed no change. Of the patients with primary optic atrophy none were made worse, and 1 whose visual fields are shown (fig. 2) improved slightly but definitely in both fields and visual acuity, with concomitant improvement in the spinal fluid. There is some question as to whether the sector defect in the left field is not a residue of a retrobulbar neuritic process. Of the total of 7 patients with lightning pains, 2 were completely relieved, 1 improved 50 per cent, 2 improved 25 per cent, 1 was unchanged and 1 became worse.

Of 16 patients with various forms of meningovascular neurosyphilis, 6 presented no data on clinical improvement. Of the remaining 10, clinical improvements of 75 per cent were observed in 2, 50 per cent in 2 and 25 per cent in 2, with 3 showing no change and 1 becoming worse.

It is of course difficult to evaluate symptomatology into which elements of the subjective and the influence of suggestion, rest, practice (as in eye and station and gait tests) enter. The intervention of trifling or routine medication (as in the eye, for example) with improvement found to have begun before penicillin, and hence

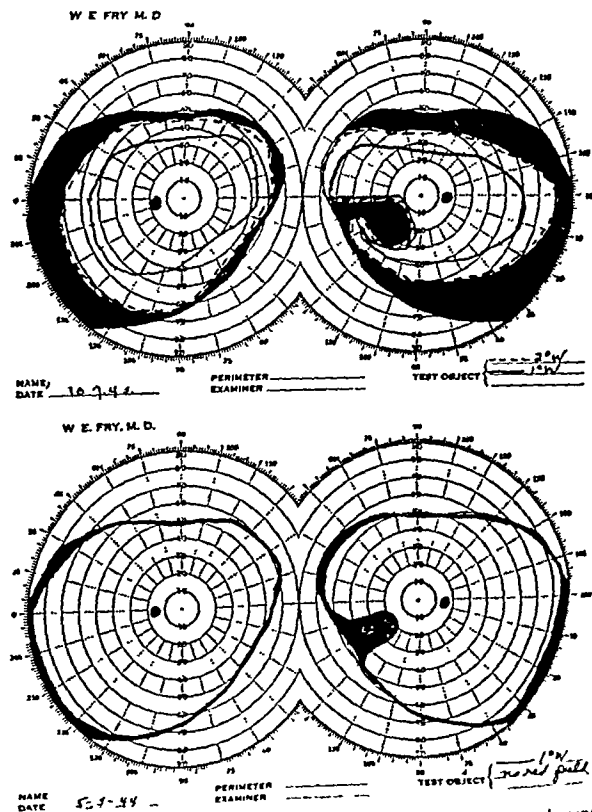


Fig. 2—Visual fields in case 3, Pennsylvania Penicillin Series, showing improvement with decrease in sector defect.

perhaps merely spontaneous or progressive, must be interpreted by long periods of observation. Symptomatology which is highly complex and of uncertain origin, such as lightning pains, in which the influence of the penicillin on other infective backgrounds may play a part, must be interpreted at this stage with reserve. There seems, however, to be a favorable trend in the

evidence pointing to genuine and indeed rapid good effect on the disease process, supported by such objective detail as handwriting change, encephalograms, disappearance of ptosis and of violent headache associated with meningitis. Coupled with the objective changes in the spinal fluid, such evidence would seem to deserve great weight. It is, however, unreasonable to expect penicillin to restore degenerations and replace neurons.

EFFECT OF TREATMENT SYSTEM

In this material the lack of system in dosage and time intervals reduced the number of cases per recognizable system below statistically usable levels, especially when viewed in relation to duration of observation. Some cases were jumbles of methods and had to be discarded. There were no blood level determinations, and in 3 Mayo Clinic cases spinal fluid penicillin determinations were repeatedly negative. Accordingly, only a study of type A versus type B treatment was attempted, type A representing 1,200,000 units or less, usually at 25,000 units every three to four hours, and type B 2,400,000 units to 4,000,000 units or more at 25,000 to 50,000 every two to four hours. Offhand there was no strik-

spinal fluids and completely achieve them on retreatment with a similar dosage, a steplike method of successive moderate applications of treatment as distinguished from a single massive session would seem to deserve further study. Pushing the patient over the hump, so to speak, to a partial self cure is a recognized principle in dealing with some aspects of late neurosyphilis.

Serologic response on the blood occurred in 45 per cent of the type A or smaller dose treatment cases, and in 43 per cent of the larger dose or type B cases. Longer observation periods for the type B cases would probably demonstrate a superior effect.

PENICILLIN RESPONSE IN RELATION TO INFLAMMATORY ACTIVITY

Using the cell count and the spinal fluid as a guide and rating 0 to 20 as low, 21 to 60 as medium and 61 and above as high cell counts, an attempt was made to see whether improvement was greater in cases showing a high cell count as an index of definite inflammatory activity in comparison to those showing low cell counts. With cell counts rated as high, improvement occurred

TABLE 14.—Effect on Spinal Fluid of Type A (Small Dose) Versus Type B (Larger Dose) Treatment

Type of Neurosyphilis	Grade of Response													
	Grade 1		Grade 2		Grade 3		Grade 4		Grade 5		No Change		Worse	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Paresis and taboparesis.....	1	5	2	15	1	2	3	1	0	0	1	3	1	2
Tabes.....	1	3	0	1	0	1	2	2	0	0	0	5	1	0
Meningovascular.....	0	2	1	1	1	3	3	0	0	0	0	0	0	1
Asymptomatic.....	1	6	2	3	1	5	4	5	1	0	3	3	6	0
Grade totals.....	3	16	5	20	3	11	12	8	1	0	4	11	8*	3
Total type A.....	36		36		36		36		36		36		36	
Total type B.....		69		69		69		69		69		69		69

* Four of these patients had benign gummas healing under penicillin at a wholly inadequate dosage for neurosyphilis—less than 600,000 units. Grade 1 and 2 (slight) improvements occurred in 22 per cent of type A and 52 per cent of type B cases. Grades 3, 4 and 5 (definite) improvement occurred in 16 of 36 cases (44 per cent) on type A treatment and 19 of 69 cases (27.4 per cent) on type B treatment. Grades 2, 3, 4 and 5 improvement occurred in 60 per cent of the type A and 56 per cent of the type B cases. The periods of observation, however, were longer in the smaller dose treatment cases—e. g., paresis, over sixty days in type A; less than sixty days in all but 5 in type B cases.

ing difference recognizable between the effect of shorter time intervals or larger doses except the induction of Herxheimer reactions, which could be avoided by reduction in the dosage of the first twenty-four to forty-eight hours. The analysis of the case material on which treatment information was sufficiently complete for classification, comprising 105 cases, is given in tables 14 and 15.

It must be clearly recognized that such figures as these do not provide for trustworthy therapeutic inter-

pretations. It is particularly in point that the observation periods on the type B (larger dose) treated cases are shorter than those of type A and that a longer observation period may demonstrate a greater efficiency of larger dosage. On the other hand, it is also suggested that in late neurosyphilis good effects may be secured by less than the maximum dosage so far employed. If patients treated with 1,200,000 units in asymptomatic neurosyphilis can achieve almost normal in 11 of 31 cases; with those rated as medium, in 13 of 28 cases; in those rated as low, in 7 of 45 cases. It appears that the proportion of improvement is highest in patients with medium and high cell counts in the order named and lowest in patients with low cell counts. If all cell counts above 20 are rated as high, improvement occurs in 24 of 59 cases in the higher cell count brackets (40.6 per cent) and in 7 of 45 in the low cell count bracket (15.5 per cent). Considering the small numbers of cases and the arbitrary division lines, the figures cannot be more than suggestive that, as has been previously indicated, a low cell count has a less favorable prognosis under penicillin treatment than a high cell count.

TABLE 15.—Degree of Cerebrospinal Fluid Improvement

Type of Treatment	Number of Cases	Slight, Grade 1, 2	Moderate to Definite, Grades 3, 4, 5	No Change or Worse
Type A	36	8 (22.2%)	16 (44.4%)	12 (33.3%)
Type B	68	35 (51.4%)	19 (27.9%)	14 (20.5%)

INFLUENCE OF PREVIOUS (ARSENIC, HEAVY METAL) TREATMENT ON PENICILLIN RESPONSE

An analysis of 100 cases of neurosyphilis with data on this matter yielded the results shown in table 16. The results in this case included grade 1 as well as grades 2, 3, 4 and 5. The type of previous treatment approximated the captions given, the first numeral representing arsenical, the second heavy metal injections.

Almost equally good results in the spinal fluid were achieved by penicillin after no previous treatment and intensive (40-80) routine treatment. There is at least no intimation that previous fever therapy prepared the

pretations. It is particularly in point that the observation periods on the type B (larger dose) treated cases are shorter than those of type A and that a longer observation period may demonstrate a greater efficiency of larger dosage. On the other hand, it is also suggested that in late neurosyphilis good effects may be secured by less than the maximum dosage so far employed. If patients treated with 1,200,000 units in asymptomatic neurosyphilis can achieve almost normal

patients for striking penicillin results. The many qualifications on such an analysis with regard to selection, time of observation and so on must be recalled, but there is at least no strong evidence that in the aggregate previous standard treatment adds anything to the penicillin result.

PENICILLIN IN OTHER ASPECTS OF LATE SYPHILIS

Gummatous lesions of skin and bones (21 cases) respond so invariably and completely, with 13 results rated 100 per cent, 2 at 75 per cent, 4 questionable and only 2 failing of improvement (thirty-six and sixty-eight days), that little further clinical interest attaches to the group beyond speculation as to the part played by penicillin in clearing the secondary, usually hemolytic pyogenic infective invasion as distinguished from the syphilis as such. The control of destructive lesions of the palate and septum seems satisfactory. The failures include one suspected gumma of the orbit, diagnosis not established. The dosage required for symptomatic improvement ranges about 300,000 units, the time for healing from twelve to forty-six days. Carcinoma as a complication or a diagnosis must be watched for

TABLE 16.—*Spinal Fluid and Clinical Improvement in Neurosyphilis After Penicillin Treatment in Relation to Previous Treatment*

Type of Previous Treatment	Clinical Improvement Grade 1 and Over Occurred in:	Spinal Fluid Grades 1, 2, 3, 4, 5 Occurred in:
No treatment.....	16 of 32, or 50 per cent	28 of 32, or 87 per cent
Little treatment.....	9 of 23, or 39 per cent	16 of 23, or 69 per cent
20 arsenic, 20 heavy metal.	7 of 16, or 48 per cent	9 of 16, or 56 per cent
40 arsenic, 80 heavy metal.	5 of 16, or 30 per cent	13 of 16, or 81 per cent
Fever therapy.....	1 of 13, or 7 per cent	5 of 13, or 46 per cent

even if improvement occurs. Concomitant neurosyphilis was identified in 12 of the 21 cases. Serologic improvement (titer reduction) in the blood occurred in 14 of 21 cases.

The paradox of gummatous skin and bone lesions healing as the spinal fluid became "worse" (possible Herxheimer effect?) was noted in 3 of 10 cases.

LATE CONGENITAL SYPHILIS

The interest in this group centers on interstitial keratitis. The neurosyphilitic involvements were reviewed with neurosyphilis (see cases 5, 11 and 50). The complexity of interstitial keratitis and the eccentricities of its behavior are apparent under penicillin as under standard treatment. It was difficult to dissuade those in charge of some patients to withhold fever and other treatment if the patient did not immediately and strikingly improve. Patients with pronounced corneal and other ocular damage were included and too much was expected in the way of results. Of 14 cases 6 showed improvement, 3 of grade 4 on a scale of 1, 2, 3, 4, 1 of grade 3 and 2 of grade 2. Six showed no improvement and in 2 the condition was definitely worse. When improvement occurred it was apt to be dramatic. One patient previously given chemotherapy and fever energetically without result was given 1,200,000 units in eight days. He was relieved of photophobia by the third day and returned to work a week after penicillin for the first time in many months. He has remained well, improvement continuing up to the stage of stationary residue. Another improved grade 4 and one hundred and four days after penicillin flared and recovered again without further treatment. A persistently seronegative congenital syphilitic patient with characteristic stigmas made no response and in fact became worse

under 1,200,000 units. One of McDermott's patients, a fever failure, received a total of 4,845,000 units in two courses without results. Thomas secured improvement in a case on 4,000,000 units over twenty-five days, 20,000 units every three hours. Moore has excellent serial color photographs of a favorable case. One of his cases likewise improved on 3,970,000 units in twenty-one days, observed for one hundred and fifty-nine days.

OTHER EYE LESIONS

Two cases of optic neuritis on 2,000,000 and 3,000,000 units both showed improvement; O'Leary's case improved 100 per cent on retreatment. Two cases of iritis improved 100 per cent, but 1 relapsed and required an iridectomy for beginning glaucoma, after failing to respond to retreatment.

EIGHTH NERVE DEAFNESS

Eighth nerve deafness, beginning in a woman of 31 with undoubted stigmas of congenital infection, improved somewhat though not definitely on 1,200,000 units. There was a suggestion of Herxheimer-like drop in hearing at the outset followed by improvement, but the interpretations are complex. Two other cases, already far advanced, failed to improve.

MISCELLANEOUS CASES

A scattered group of cases, on which information is incomplete, includes bone-liver combinations, hepatosplenic complexes, seroresistance (Wassermann fastness) already discussed, Charcot hip and gangrenous balanitis in a syphilitic patient. The Charcot hip did not improve, and a suspected Charcot ankle is developing since penicillin. The gangrenous balanitis healed with the loss of less than a third of the corpus spongiosum on 300,000 units at about the rate to be expected of a late syphilid. The patient became seronegative. The livers of 2 patients undoubtedly enlarged (late cases) after treatment and the blood bilirubin increased in 1, then subsided.

REACTIONS TO PENICILLIN

Penicillin is not a reactionless drug. The disposition to pour it about like water in syphilis may lead to serious trouble, especially from therapeutic shock and possibly also from therapeutic paradoxical effects. The former is important under the usual rule that an active syphilitic process in a vital structure may be gravely and even fatally damaged by the impact of a large dose or series of doses at the start of treatment. Most Herxheimer effects, however, seem controllable by reduction in dosage for the first twenty-four to forty-eight hours of an eight day series without loss of ultimate effect. There is some question whether there are not delayed Herxheimer effects such as are suggested by spinal fluid and blood serologic curves and the initially unfavorable but ultimately favorable course of some lesions (eye, nervous system, for example).

Of 182 cases 43 (24 per cent) had reported reactions interpretable as Herxheimer or therapeutic shock effects. Of these 23 were fever, highest 105.5 F. The blood reagin titer increased definitely and then subsided in 7 cases. In 4 Pennsylvania cases symptoms interpreted as Herxheimer effects in the nervous system included transverse myelitic symptoms in 1 case, Jacksonian convulsions lasting twelve hours in another, exacerbation of lightning pains, mania and hallucinations.

Other reactions to penicillin included urticaria (2 cases) and 1 each of "allergic reaction," "id" reaction, burning of the skin, profuse sweating and phlebitis (intravenous injection). Two patients had sharp gastrointestinal reactions.

SUMMARY

From a material of 182 cases of late syphilis preponderantly neurosyphilis (122 cases) and including benign gummatous syphilis, ocular and other forms of syphilis and late congenital syphilis, observed from eight to two hundred and fourteen days after the penicillin therapy was begun on a wide range of time-dosage schedules, the following tentative observations are summarized:

1. The lesions of benign gummatous syphilis of skin and bones heal under a dosage of approximately 300,000 units in twelve to forty-six days.

2. Irrespective of the system used, and in all types of syphilis, penicillin causes reduction of syphilitic reagin titer in the blood in from 50 to 60 per cent of late cases. An initial "Herxheimer"-like or provocative rise is observed in about 20 per cent of cases. Only 5 sero-resistant cases were treated, 1 made negative, 4 improved.

3. The abnormal spinal fluid in neurosyphilis is improved in 74 per cent to some degree, definitely in 33 per cent. The commonest change is a drop in cell count and total protein (grade 2 improvement on a scale of 5) occurring in 67 per cent of cases. One spinal fluid was rendered normal within the observation period. All four fluid findings improved in 25 per cent of the cases of asymptomatic neurosyphilis, 10 per cent in paresis and taboparesis.

4. Symptoms improved in neurosyphilis as follows: Simple demented paresis: In 30 cases on which data were adequate for classification, 80 per cent improved to some degree; nearly half improved 50 per cent or more, including 8 who improved 75 per cent and 1 restored to normal. Deteriorated paresis: Two of 10 improved 75 per cent, 1 50 per cent, 7 no change. Tabes dorsalis: One fifth of 14 cases improved 50 per cent or more. Of 7 with lightning pains, 2 were completely relieved, 1 improved 50 per cent, 2 improved 25 per cent, 1 unchanged and 1 worse. Of 7 cases of primary (?) optic atrophy, mostly advanced none were made worse, 1 improved. In meningovascular neurosyphilis 40 per cent improved 50 to 75 per cent.

5. Two attempts at statistical evaluation were made: One, of the influences of smaller dose as contrasted with larger dose treatment and the other, of the response under penicillin of spinal fluids with low as contrasted with relatively high cell counts, because of small numbers of cases and unavoidable disparities in observation period, cannot be accepted as beyond challenge. They suggest respectively that in late syphilis, especially neurosyphilis, smaller doses, if not grossly inadequate, have good effects which may perhaps be improved by repetition, as compared with the effects of initial larger dosage, the effect being due perhaps to stimulation or utilization of the patient's resistance and defensive responses. The figures on response in relation to cell count suggest that moderate and high cell count cases tend to react somewhat better than cases giving low cell counts.

6. Previous treatment for syphilis by older methods in neurosyphilis, including fever therapy, does not appear to prepare patients for superior results with penicillin.

7. In late congenital syphilis, interstitial keratitis presents rather equivocal though at times dramatically favorable results, not as yet interpretable in relation to a time-dosage system. Of 14 cases 6 improved, 3 to 100 per cent, 1 to 75 per cent, 2 to 50 per cent. Two were made definitely worse.

8. Optic neuritis included 2 cases, both improved, the second 100 per cent on retreatment. Two cases of iritis improved 100 per cent at the start, but 1 relapsed and did not respond to retreatment (glaucoma).

9. Two cases of eighth nerve deafness gave equivocal results.

10. Of miscellaneous cases, Charcot joint was unaffected (a new one developing); gangrenous balanitis was cured by low dosage.

11. Therapeutic shock (Herxheimer) effects are undoubted, may be serious in late syphilis and should be guarded against by reduced dosage during the first twenty-four to forty-eight hours. Severe cerebral and cord symptoms may develop in neurosyphilis.

Reactions to penicillin as such are few and not serious, urticaria, itching, allergic skin reactions and a sharp gastrointestinal reaction following the course.

12. It is suggested that, because of the great difficulty in developing uniform records for statistical or punch machine evaluation in late syphilis, further investigation of its behavior under penicillin therapy be committed to individual competent investigators who can apply the principles of uniformity of treatment and record evaluation simultaneously with appropriate individualization of the particular case. The durability of the good effects thus far observed, the possibility of complications from induced allergic response and disturbance of the immunity balance of the individual in latent and late syphilis remain to be explored by larger experience and longer periods of observation.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MAHONEY, ARNOLD AND STERNER AND MESSRS. HARRIS AND ZWALLY, OF DRS. MOORE AND MAHONEY, COMMANDER SCHWARTZ, LIEUTENANT COLONEL STERNBERG AND DR. WOOD, AND OF DR. STOKES, LIEUTENANT COLONEL STERNBERG, COMMANDER SCHWARTZ AND DRS. MAHONEY, MOORE AND WOOD

LIEUTENANT COMMANDER E. E. BARKSDALE, MC-V(S), U.S.N.R.: As of June 1, 1944 we have treated 161 cases of syphilis with penicillin. Twenty-nine were seronegative, dark field positive, primary syphilis, clinically cured and are still seronegative to date. Eighty were seropositive, dark field positive primaries. Of this group 2 relapsed within approximately three weeks after treatment was started. The lesions recurred in the same location and again became dark field positive. One of this group healed, becoming seronegative, and then acquired a new infection with a dark field positive chancre in a different location from the previous one. We have treated 31 cases of secondary syphilis. All the cases were treated on a dosage of 1.2 million units intramuscularly, i. e. 20,000 units every three hours for sixty injections. By determining quantitative blood penicillin levels on these patients treated with intramuscular injections every three hours, we found that it was impossible to maintain a constant penicillin level, and indeed for one third of the time there was no penicillin detected in the blood by the test used. This made us think that the continuous intravenous drip method might be the procedure of choice. To date we have treated 11 cases of syphilis by this method, giving a total of 2,080,000 units of penicillin in nine days. With this we were able to maintain a more or less constant blood penicillin level approximately ten times higher than that which could be obtained by the intramuscular route. We have had no

relapses, no central nervous system involvement and no case has retained a positive serologic reaction as yet beyond the fourteenth week. To date, we have treated 7 cases of syphilis with the usual routine of fever therapy but substituting for mapharsen 60,000 units of penicillin intravenously each time they were in the fever cabinet. In addition and over the same period of time we gave each patient 20,000 units of penicillin intramuscularly every three hours until a total of $3\frac{1}{2}$ to 4 million units had been given. It is our impression that this method is superior to the one which we had formerly used. I am of the opinion at the present time that penicillin is the best drug we have ever had for the treatment of syphilis. I think that it is possible that the intravenous method of administration may be superior. We have had 1 case of primary syphilis treated intramuscularly with 1.2 million units, which ended fatally ten days after the completion of treatment, of a subdural hemorrhage which was not related to either the syphilis or the treatment. Pathologic examination of body tissues with special stains failed to reveal any spirochetes. At autopsy therefore this 1 case within ten days after treatment gave no pathologic evidence of syphilis.

CAPTAIN WILLIAM LEIFER, M. C., A. U. S.: The experience at Fort Bragg now comprises 116 patients treated for syphilis with penicillin. One hundred received 1,200,000 units and 16 received 2,400,000 units in seven and one-half days (technic sixty consecutive intramuscular injections of 20,000 or 40,000 units at three hour intervals). Reactions were infrequent and inconsequential: there were 3 instances of urticaria, 1 of erythema multiforme, 2 of generalized pruritus and 7 of herpes simplex. Focal and systemic Herxheimer reactions appeared on the first day of treatment in 87 per cent of the patients. Only those who received 1,200,000 units and who have been followed at least three months are being reported. Ten patients began treatment in the seronegative primary phase and 12 in the seropositive primary phase. Four have been observed over six months, of whom 3 are seronegative, while the fourth has a doubtful Kahn reaction. All 4 had negative spinal fluids at six months. The remaining 18 patients have been followed from three to six months, and all but 1 are seronegative. Thus, 20 of the 22 cases of primary syphilis have achieved or maintained seronegativity. Twenty-five patients began treatment in the secondary stage of syphilis. Two have exceeded six months of observation; 1 is seronegative and the other has a doubtful Kahn reaction. Both had negative spinal fluids at six months. The remaining 23 patients have been followed between three and six months; of these, 11 are seronegative, 9 still have some degree of positivity of the blood and 3 are definitive failures. Two failures appeared as neurologic relapses (1 with monoplegia, the other with acute syphilitic meningitis) with strongly positive spinal fluid; the spinal fluid had been negative in both of these immediately before administration of penicillin. The third failure was a cutaneous and serologic relapse. Thus, of 25 cases of secondary syphilis 12 are seronegative, 10 are still seropositive and 3 are outright failures. It would seem best to use higher doses than might now appear necessary in the treatment of syphilis. The future may reveal the need not only for an increase dosage but also for prolongation of the treatment period beyond the present seven and one-half days. Thus far the results have been extremely encouraging, but mass treatment of syphilis with penicillin should be delayed until the optimal treatment schedule is determined.

COMMANDER FRANK A. ELLIS, Corpus Christi, Texas: I should like to give you some of the highlights of the experience with penicillin starting in New Zealand in Wellington and extending up to Corpus Christi. An enlisted man with acute infectious jaundice, after being in the hospital five days, developed an acute gonococcal urethritis. His icterus index was 45, and we gave him penicillin; it cured his gonorrhea, and his icterus index was brought down to 0.5. Penicillin might cure acute jaundice or acute infectious jaundice, as we designate it in the Navy. Our results in probably 450 cases of acute gonococcal urethritis have been 100 per cent effective, with this exception: We had 2 cases in which acute epididymitis developed three days after administration of 100,000 units of penicillin. On those we immediately repeated the therapy and gave them 200,000 units until the smears, urine culture and prostatic

cultures were negative. My impression is that it certainly shortens the course of acute epididymitis. Our results have been most disappointing in penicillin therapy for nonspecific urethritis. With syphilis I have had no experience whatever except this, that I want to caution you about intraurethral chancre being masked in acute gonorrhea. If patients are given 100,000 units, the dosage will be inadequate.

COLONEL UDO J. WILF, U. S. P. H. S.: It is too much to expect of penicillin at this time more than has been graphically told by the authors. We should accept these facts with the possibility that in time the organisms may elaborate for themselves a certain degree of resistance to penicillin. When we can speak in terms of thousands instead of terms of hundreds, we may have more relapses and more recurrences and possibly more reactions. It is, however, a great relief to those of us who have for years felt that we were using dangerous drugs in the treatment of syphilis to find something at least that departs from heavy metals that gives a high index of therapeutic effectiveness and apparently a low toxicity.

DR. JOSEPH E. MOORE, Baltimore: I close on the same restrained note of optimism which has been voiced to you here. I don't think that penicillin is ready for mass application. I do feel that our attitude ought to be one of hopefulness, but with complete understanding that we are still in the process of learning how to use the drug. We don't know yet, and it is going to be some time before we are sure.

SOME HARMFUL EFFECTS OF RECUMBENCY IN THE TREATMENT OF HEART DISEASE

SAMUEL A. LEVINE, M.D.
BOSTON

Rest of the affected part is a fundamental form of treatment in many diseases. When a bone is fractured, splints are applied and the involved parts are immobilized. This not only diminishes pain but speeds repair and healing. When a lung is actively affected with tuberculosis, attempts are made to diminish the movements of the diseased lung. The phrenic nerve may be sectioned, pneumothorax produced or thoracoplasty performed, the purpose of these procedures being to rest the affected organ. In a similar way when the heart is diseased, rest in bed has been urged as a means of diminishing its work. Not so long ago the relative value of rest and exercise was much debated and was summarized by Pratt,¹ who strongly advocated prolonged rest in bed for heart failure. At present all students and physicians have been forcefully impressed with the great importance of rest in bed, although in practice one finds great variations in the degree to which the principle is applied. Under similar circumstances one physician may keep a patient in bed a few days, another a few weeks and a third a few months. What should be our guide and what are the hazards, if any, of strict bed rest?

At the outset, a clear distinction must be drawn between the function and dynamics of the heart and the conditions that obtain in other organs. One important peculiarity of the heart is that it has two sides, right and left, and that serious difficulties may ensue if an imbalance develops between the two. If the right ventricle expels one drop of blood less than the left ventricle, within a few hours there will be increased

From the Medical Clinic of the Peter Bent Brigham Hospital and the Department of Medicine, Harvard Medical School.
Read at the dedication of the National Institute of Cardiology, Mexico City, Mexico, April 20, 1944.
1. Pratt, J. H.: Rest and Exercise in the Treatment of Heart Disease, South. M. J. 13: 481, 1920.

venous pressure and pronounced engorgement of the liver. Contrariwise, if the right ventricle expels one drop more than the left ventricle there will result pronounced pulmonary edema. In each instance 250 to 500 cc. of blood would be trapped either in the systemic venous system or in the pulmonary circuit. Similarly it follows that, when there is definite pulmonary congestion, those measures that reduce the return flow to the right side of the heart, and therefore the output of the right ventricle, relieve pulmonary congestion and help to restore the balance between the two sides. We are all familiar with the beneficial effects of phlebotomy or the application of tourniquets to the extremities in this regard.

With the foregoing considerations in mind it is well to analyze the effects of putting a cardiac patient to bed. In general, rest obtained in this way decreases the total bodily demands or basal metabolism, slows the heart rate and may lower the blood pressure. All this decreases the work of the heart. The one factor that has been overlooked, for the most part, is that the effect of recumbency is also to encourage venous return. As the lower part of the legs remain elevated and approximate the level of the right side of the heart, tissue edema more readily disappears through the lymphatics, capillaries and venules. The result of this mechanism is to increase rather than to decrease the work of the right side of the heart. When this effect is considerable and the left ventricle is so weak that it cannot keep pace with the increased output of the right ventricle, during the hours or days of recumbency, pulmonary congestion and resultant breathlessness may actually increase. In other words bed rest, for a while, may impose greater rather than less work on the heart.

All physicians are familiar with the clinical events that take place during an acute attack of nocturnal cardiac dyspnea or so-called cardiac asthma. A patient, generally with hypertension, coronary or aortic valvular disease goes to bed feeling fairly well and about 2 o'clock in the morning is awakened with breathlessness, suffocation and possibly cough and wheezing. He generally jumps out of bed, walks around the floor in his agitation, goes to a window for air or sits up in bed with his feet hanging down. In fifteen minutes or a half hour the attack may be over and he falls back to sleep. Some find that they can sleep the remainder of the night only if they sit in a chair. The surprising thing is that, although our patients have long been aware of the harmful effects of the bed and have dreaded the nights, we as physicians would generally insist that they be put on a strict bed regimen. Many of our patients would emphatically state that they felt quite well while they were up and about, some of them even being able to do quite a bit of work during the day but had all their trouble in bed. With equal persuasion we would maintain that they had to go to bed.

It is true, however, that in most cases when we put such patients to bed no harm resulted. In fact, they generally improved. Often the nocturnal dyspnea disappeared and both the patients and the physician became convinced that bed rest was valuable. Nevertheless a closer analysis will reveal, I believe, that some temporary ill effects were produced but that in most instances the various methods of treatment employed were effective enough to counterbalance and mask them. Only when the entire program of treatment is ineffective do we see gross evidence of the deleterious results that

are produced by bed rest. I recall, as many physicians will on close reflection, frequent instances in which shortly after ordering an ambulatory cardiac patient to bed pulmonary rales and hydrothorax, previously absent, quickly appeared. Such a patient may have complained of nocturnal dyspnea and shown no peripheral edema or slight pitting of the legs. The lung bases were clear of rales at that time. Ordinarily with complete bed rest the nights are made comfortable by the use of hypodermics of morphine until the effects of digitalis, diuretics, diet, phlebotomy and other measures have improved the situation so that pulmonary congestion clears and breathing becomes normal. But in the type of case mentioned, for one reason or another the progress is down hill because the customary treatment is not effective enough to undo the harm done by the recumbent posture. Such a patient often shows complete disappearance of peripheral edema but now needs a thoracentesis for a right hydrothorax. Even if no pitting is apparent we must realize that patients may have several liters of latent edema without pitting. It also must be borne in mind that fluid in the legs may be unsightly but does comparatively little harm, whereas fluid in the lungs is a dangerous handicap.

Another illustration of the shift of fluid from the lower to the higher portions of the body in decompensated cardiac patients is the disappearance of pitting edema of the ankles while extensive edema of the lower part of the back develops. Physicians often seem pleased that the ankles have returned to normal size in their cardiac patients who are confined to bed and overlook the fact that the same fluid is still within the body, only now is distributed in its upper portions.

One might ask what evidence there is that it is the bed rest that causes these changes. First, it is the experience of our patients (just cited), who often are our best teachers. Then it is the clinical detection of increasing signs of pulmonary congestion in some cases (while the peripheral signs decrease) coming during the first few days after bed rest has been instituted. Finally, certain laboratory data afford convincing proof to support these clinical impressions. It is known² that normally there is a decrease in the total lung volume of over 300 cc. and a decrease in the vital capacity of the lungs of about 200 cc. in the recumbent position. These changes may possibly be greater in patients already suffering from congestive failure. Several years ago³ I made a few casual observations on the vital capacity of the lung and the velocity of blood flow just before putting cardiac patients to bed and one or two days later. The former was found to decrease slightly and the latter to slow before real improvement began. More recently a systematic study was made by Perera and Berliner⁴ on the effect of posture on the dynamics of the circulation in normal individuals and in patients with paroxysmal nocturnal dyspnea. They found that the assumption of the horizontal position caused a decrease in serum concentration and slight increase in venous pressure in both groups. The serum protein was also found to rise toward the normal levels in patients about fifteen minutes after the attacks of dyspnea were over. The

2. McMichael, J., and McGibbon, J. P. Postural Changes in the Lung Volume, *Clin. Sc.* 4: 175, 1939.

3. Levine, S. A. The Management of Patients with Heart Failure, *J. A. M. A.* 115: 1715 (Nov. 16) 1940.

4. Perera, G. A., and Berliner, R. W. The Relation of Postural Hemodilution to Paroxysmal Dyspnea, *J. Clin. Investigation* 22: 25, 1943.

only reasonable interpretation that can be made from these observations, and the conclusion drawn by these authors, is that with recumbency hemodilution and increased blood volume occur as a result of the flow of fluid from the tissue spaces into the blood stream. This obviously is deleterious to cardiac patients, and when there is a tendency to dyspnea from left ventricular weakness or from serious mechanical obstruction of mitral stenosis serious pulmonary edema may result.

An increase in blood volume is one of the most constant findings in congestive heart failure, and effective treatment is always concomitant with a decrease of blood volume toward normal. The observations cited show that recumbency produces, at least temporarily, exactly the effect that is undesirable by increasing the total volume of blood and as a result the work of the heart. It is clear therefore that, although the fundamental principle that rest is beneficial for the heart remains undisputed, the recumbent position in some cardiac patients may actually increase the work of the heart. To be sure, this effect is often temporary; for when sufficient improvement has occurred the left ventricle is able to expel its quota of blood or the right ventricle no longer delivers an excess into the pulmonary circuit and a proper balance has been established. From then on rest in bed does accomplish its purpose in diminishing the total work of the heart.

There are other difficulties that may follow prolonged bed rest both in cardiac and in noncardiac patients. In some elderly men urinary retention from an atonic bladder and prostatic obstruction may first develop after confinement to bed. This may necessitate catheterization with the occasional development of infection and its complications. Many others may develop hypostatic pneumonia, which used to be so often fatal to chronic cardiac patients.

What we have learned to be much more important is the frequent occurrence of thrombophlebitis of the legs with subsequent pulmonary embolism. The medical profession has only in the past few years become aware of the extent and seriousness of this problem. Williams and Rainey⁵ even suggested that the initial period of complete bed rest should be reduced, because in a large number of their cardiac patients pulmonary infarction and pneumonia were found to be the cause of death.

In Boston, in large measure as a result of the clinical studies of diseases of the veins by John Homans⁶ and the pioneer work on acute cor pulmonale by P. D. White and his associates,⁷ we are recognizing more and more cases of pulmonary embolism. As we all know, this is a common cause of death following operations in any surgical clinic. It is equally frequent in the medical wards in hospitals, especially in patients confined to bed for any appreciable time. Immobility of the legs, abdominal distention with its inevitable pressure on the iliac veins, and the sluggishness of the circulation in cardiac patients all result in slowing of the blood flow through the legs, which is conducive to venous thrombosis. This is particularly true of very obese and orthopneic individuals, for in a sitting position there is added constriction of the pelvic veins.

When cardiac patients are examined post mortem and pulmonary emboli or pulmonary infarction are

found, one is too ready to explain them on the basis of emboli from the right side of the heart or as a result of local thrombosis of the pulmonary vessels. Only a careful search of the veins of the legs or pelvis will reveal the great frequency of thrombosis, which proves to be the actual origin of these pulmonary complications. This entire situation is serious and in many cases the medical profession is to blame. I know I have been directly responsible for needless fatalities from pulmonary embolism in patients who would have done well had I not put them to bed. As a corollary to the foregoing we should be quick to detect any phlebitis of the leg, especially the deep type of thrombophlebitis. This often starts in the calf and is not manifested by gross swelling of the leg but rather by early pain in the calf on dorsiflexion of the foot. Certainly, if a patient with such phlebitis has one pulmonary embolism or some obscure sudden respiratory episode, ligation of the vein should be performed immediately. In fact, my fear of a fatal pulmonary embolism has become so great that I advise immediate femoral vein ligation just as soon as a deep phlebitis is recognized.

The following case reports will illustrate some of the preceding points:

CASE 1.—A shopkeeper aged 58 had a typical attack of acute coronary thrombosis April 10, 1937. Severe and increasing breathlessness developed during the following three weeks. At this time (May 3, 1937) I first saw him and found him to be irrational and considerably orthopneic, with Cheyne-Stokes breathing. The lungs were full of rales, but there was no pitting edema of the legs. The heart sounds were distant, regular and rapid. He had been in bed under an oxygen tent most of the time. I advised omitting the various medications he was receiving, such as aminophylline, digitalis and caffeine, and had him placed in a chair with his feet hanging down. Within a few hours his condition began to improve. Two days later he showed edema of the legs, but the orthopnea was practically gone and he was rational. He then received digitalis and mercupurin, had a satisfactory diuresis and gradually recovered compensation. He was still ambulatory and in fairly good health three years later. The turning point in this patient's condition occurred directly after getting him out of bed into a chair. The edema lessened in the lungs as it increased in the legs.

CASE 2.—G. H., a business executive aged 66, seen in my office Feb. 1, 1934, had been slightly short of breath for a few years but carried on his work fairly well. Since August 1933 he had frequent smothering attacks, waking him up from sleep. He would have to sit up in bed and get into a chair for relief. During the day, while he was up and about, he was comfortable.

Physical examination showed considerable cardiac enlargement, a grade 2 aortic systolic murmur, a definite gallop rhythm and a definite pulsus alternans. The rhythm was regular, with a rare extrasystole. The breath sounds were much decreased, the liver was slightly enlarged and there was moderate pitting edema of the legs.

He was put on complete bed rest in the Peter Bent Brigham Hospital and assured that he would be made comfortable, though he insisted that he feared the bed. The first few nights were in fact quite comfortable, because he was given hypodermic injections of morphine, which he had never received before. He was also started on digitalis therapy by mouth. Two days after admission, edema of the legs had entirely disappeared; but now a right hydrothorax was present, which was not there when I first put him to bed. The breathing became more labored and of the Cheyne-Stokes type. A right thoracentesis was performed, removing 1,200 cc. of clear fluid on the fourth day; and from then on, with the help of mercurial diuretics, his condition improved. As compensation was regained, an aortic systolic murmur became more prominent, an aortic systolic thrill was felt, and x-ray examination showed definite calcific aortic stenosis. After several weeks he became ambulatory and free from dyspnea and edema.

5. Williams, R. H., and Rainey, J.: The Causes of Death in Patients with Congestive Heart Failure, *Am. Heart J.* 15: 385, 1938.

6. Homans, J.: Thrombosis of the Deep Veins of the Lower Leg Causing Pulmonary Embolism, *New England J. Med.* 211: 993, 1934.

7. McGinn, S., and White, P. D.: Acute Cor Pulmonale Resulting from Pulmonary Embolism: Its Clinical Recognition, *J. A. M. A.* 104: 1473 (April 27) 1935.

This is a striking instance of a shift of fluid from the periphery to the chest on putting a cardiac patient to bed. The patient did become worse as a result of the position in bed and showed improvement only when active cardiac therapy caught up with and undid the harm done by recumbency. This might have been avoided if he had been treated in a more upright position or in a chair during the first week.

CASE 3.—E. G. B., a housewife aged 58, came to my office Nov. 27, 1936 complaining of weakness, dizzy spells and inability to lie flat because of shortness of breath and choking feelings. These symptoms began only a few months before she was first seen.

The patient was obese, weighed 98 Kg. and was 61 inches (155 cm.) in height. The heart was entirely normal, the lungs showed a few basal rales, the abdomen was prominent but otherwise not remarkable, and there was slight puffiness of the legs. The blood pressure was 180/105. The urine was normal. The vital capacity of the lungs was much decreased (1,400 cc.). The electrocardiograms were normal.

She was sent to the hospital with a diagnosis of obesity and slight hypertensive heart disease. She was put on a 600 calory diet, kept in bed and given digitalis. She lost about 6 Kg., though there was no diuresis. There was no change in her clinical condition and there was never any evidence of phlebitis of the legs. On December 26 she suddenly developed severe dyspnea. This was erroneously regarded as left ventricular failure, and digitalis, which had previously been omitted, was reinstituted. She remained dyspneic thereafter and died suddenly on Jan. 1, 1937.

Postmortem examination showed some cardiac hypertrophy and dilatation but no cardiac thrombi or significant coronary artery disease. There were numerous pulmonary infarcts and large adherent antemortem clots in each pulmonary artery. A large fresh red friable thrombus was present in the right common iliac vein.

This is an instance of acute fatal pulmonary embolism coming during the course of bed care in an obese hypertensive woman. It seems more than reasonable that this would not have occurred if she had remained ambulatory. Both the immobility of the legs during her period in bed and the pressure of the large abdomen on the pelvic veins, which was accentuated by the sitting position in bed, must have been precipitating factors in the production of thrombosis of the veins of the legs, which led to the pulmonary embolism.

CASE 4.—D. W., a hotel manager aged 52, entered the Peter Bent Brigham Hospital Feb. 10, 1944 complaining of frequent attacks of pain in the midchest. Beginning in February 1941 he had had attacks of pressing pain in the midsternum, radiating into both shoulders and arms. These came on effort, especially walking, and would make him stop, whereupon the attack would let up. The attacks were relieved promptly by glyceryl trinitrate. Despite this he got along quite well until the fall of 1943, when attacks became frequent, even at rest, so that finally he used 10 to 15 glyceryl trinitrate pills daily.

The patient was very obese, weighing 100 Kg. There was no enlargement of the heart, the rhythm was regular and there were no murmurs. The lungs were clear and the abdomen was negative except for prominence due to obesity. No pitting edema was present. The urine was normal. The electrocardiograms showed slight rounding and inversion of T_1 , flat T_2 and sharply inverted T_4 .

He was put to bed in the hospital because of the frequent attacks of classic angina pectoris. Studies of the blood and other laboratory procedures were not remarkable. He was put on a diet of 1,000 calories, and promptly the attacks disappeared, so that he used only a few glyceryl trinitrate pills during his entire hospital stay, losing 10 Kg. in weight.

Because he had a stout abdomen he found it uncomfortable to lie perfectly flat. He also believed that attacks were more likely to come if he was recumbent. The result was that he

sat up in bed most of the time. We were quite encouraged at the quick disappearance of the anginal attacks, when on the twelfth hospital day he developed a slight fever of 101 F. and complained of feeling hot and cold and sweaty. Nothing abnormal could be found on physical examination until two days later, when he had definite pain in the gastrocnemius muscle on dorsiflexion of the left foot. He also had some mild pain in the left calf. The diagnosis of definite thrombophlebitis was made and because of the fear of pulmonary embolism a left femoral vein ligation was performed that very morning. From then on the leg did well, though a slight fever persisted for about ten days. He was ambulatory and much improved when he was discharged March 5, 1944.

This is a clear instance in which putting an obese patient to bed appeared to be directly responsible for the development of a deep phlebitis. Although the anginal state improved, the possibility of a fatal pulmonary embolism was averted only by the prompt ligation of the femoral vein. On retrospect one wonders whether it would not have been better to have him walk around. It certainly was unwise to allow this obese patient to sit in bed with the protuberant abdomen pressing on the veins of the groin a good part of the day.

COMMENT

Evidence has been presented to show that putting cardiac patients on a strict bed rest regimen entails certain hazards. When cardiac congestion is present, recumbency shifts fluid from the lower to the upper parts of the body. Edema fluid leaves the tissue spaces, enters the venous system, increases blood volume and increases venous pressure. These effects are probably temporary and transient in most cases and therefore do not appear to have any deleterious effects on the ultimate progress of the case. Not infrequently, however, this results in an aggravation rather than an improvement in pulmonary congestion, as the return flow to the right heart is enhanced, thereby increasing the output of blood from the right ventricle into the pulmonary vessels. When the left ventricle is still unable to meet this increase in work, as may happen in cases of hypertension, aortic valvular disease or coronary artery disease, dyspnea may grow worse. The same ill effects may be observed in some cases of mitral stenosis, in which the mechanical narrowing of the valve does not permit the added flow to reach the left ventricle. The situation is quite different if there is peripheral edema and engorged liver and there is no important threat of pulmonary congestion or dyspnea. In such cases recumbency will aid in diminishing right sided failure. These considerations do not vitiate the fundamental principle that rest is beneficial for heart failure. In fact, they actually substantiate this principle, because under certain circumstances recumbency is shown to increase rather than to decrease the work of the heart.

It has also become alarmingly apparent that many cardiac patients, after prolonged periods in bed, develop thrombosis of the veins of the legs with serious or fatal pulmonary emboli.⁸ This is explained partly on the immobility of the legs and partly as a result of pressure of the abdomen on the pelvic veins. The latter mechanism is very likely of considerable importance in obese individuals or in those suffering from orthopnea who have to sit up in bed. The sitting position assumed

8. Since this article was written, William Dock has published a paper emphasizing this same point, suggesting that pressure of the lower legs on the bed may play a role in causing thrombophlebitis in the gastrocnemius muscles (The Use and Abuse of Bed Rest, New York State J. Med. 44:724 [April] 1944).

by such patients must produce added pressure on these veins and thereby slows the circulation in the leg veins.

There are obvious therapeutic implications that follow from the foregoing observations. Some severely ill cardiac patients, especially those with nocturnal dyspnea, should not be kept flat in bed until active cardiac treatment has been well advanced in improving the circulation. During these early days they may sit in a chair and should be urged to exercise their legs or take short walks in their room several times daily. The bed in which they sleep should slant downward from head to foot. This can be accomplished by placing 9 inch wooden blocks under the head posts of the bed. In addition, the required number of pillows under the head should be used. Pillows alone do not meet the difficulty, as the purpose is to have the back and hips higher than the feet. Often it is best to have these patients sleep in beds raised in this fashion the rest of their lives. This may tend to prevent nocturnal dyspnea from returning. At times it is even wise to take a critically sick cardiac patient with severe pulmonary edema deliberately out of bed and place him in a chair with his feet hanging down. The purpose is to shift the fluid from the lungs to the legs. It would be better still if beds that embody this simple principle were generally available for cardiac patients at home and in hospitals.

The second precaution concerning bed care that is applicable to all patients, noncardiac as well as cardiac, who are to stay at rest for any considerable time is to have them exercise their legs frequently during the day. This is a practice that has already come into use to some extent. For the same reason, daily massage to the legs is desirable. The purpose is to prevent thrombosis of the veins of the legs and possible subsequent pulmonary emboli. In this regard, very obese individuals who are inclined to sit up in bed, or orthopedic patients who have to sit in the upright or semirecumbent position, need to be watched with particular care. The sitting position tends to produce pressure on the pelvic veins with slowing of the circulation in the veins of the legs, thus encouraging thrombus formation. It is believed that if attention is paid to the bodily position of the patient while instituting rest treatment our therapeutic results will be improved.

CONCLUSIONS

Rest in bed, which has been the backbone of our treatment of heart failure, needs reconsideration in the light of some possible harmful effects.

There is both clinical and laboratory evidence to show that recumbency may be very harmful for certain patients with heart failure. The heart may be made to work more rather than less, and pulmonary congestion may be made worse rather than better at certain stages of heart failure by placing the patient in bed. Making the bed slant downward by placing 9 inch blocks of wood under the head posts is a simple method of minimizing this undesirable effect. At times it is wise to treat patients with heart disease in a chair rather than in bed.

Cardiac as well as noncardiac patients who are confined to bed for any appreciable length of time should be instructed to exercise their legs frequently or to have massage of the legs to prevent venous thrombosis of the legs and pulmonary emboli.

270 Commonwealth Avenue.

THE ARMY AIR FORCES RHEUMATIC FEVER CONTROL PROGRAM

COLONEL W. PAUL HOLBROOK
MEDICAL CORPS, UNITED STATES ARMY

Rheumatic fever and its sequelae are of far greater significance in civilian life than is generally appreciated. Swift¹ indicates in his survey of New York State for 1938 that there were more than five times as many deaths from rheumatic heart disease as from whooping cough, measles, epidemic meningitis and anterior poliomyelitis combined. He also estimated that there were in excess of 460,000 individuals in the United States with rheumatic heart disease. Acute rheumatic fever has been considered as essentially a disease of childhood, but it has become a very serious problem among adults in the armed forces.

Under the supervision of the Air Surgeon, a program for the control of rheumatic fever and streptococcal infections has been established in the Army Air Forces. Credit for the success of the program belongs to the commanding general of the Army Air Forces, whose cooperation made it possible, and to the many medical and laboratory officers of the AAF hospitals, who have carried on these studies. The basic study was inaugurated in the spring of 1943, with forty of the larger AAF hospitals selected to cooperate in the investigation, representing approximately 25,000 beds and 800,000 troops. The posts chosen for the study were in areas of high incidence of rheumatic fever, areas of low incidence and intermediate areas. The geographic distribution of the areas studied is shown in figure 1. These hospitals, in addition to the usual laboratory facilities present at each, are served by ten strategically located and specially equipped laboratories for the grouping and typing of hemolytic streptococci.² Six hospitals located in the areas of lowest incidence were selected to receive patients with rheumatic fever for convalescence. The transfer to these hospitals is usually accomplished by air and can be carried out at a very early stage of the disease. For comparison, control groups are retained in the area in which the rheumatic fever was contracted.

At some air bases the incidence rates for the year 1943 were in excess of 25 per thousand troops involved (figs. 2 and 3). During the peak of the rheumatic fever season one large post experienced rates in excess of 100 per thousand annually. Other geographic areas showed a very low incidence. The total number of new cases for 1943 is large, but statistical data cannot be released at this time.

A consideration of the days lost from duty by this group, the long hospitalization, the large percentage of the group who will be permanently incapacitated, the inevitable compensation for disability and the future necessary medical care by veterans' facilities will indicate to some extent the magnitude of this problem.

The exact etiology and pathogenesis of rheumatic fever is still unknown. Whether it is a sequela disease

Read before the joint meeting of the Section on Practice of Medicine and the Section on Experimental Medicine and Therapeutics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Swift, H. F.: Features Which Suggest Public Health Consideration of Rheumatic Fever, *Bull. New York Acad. Med.* 16: 501-513 (Aug.) 1940.

2. The special laboratory studies were made possible through the assistance of the Rockefeller Institute, the Josiah Macy Jr. Foundation and the Presbyterian Hospital, New York.

to a group A hemolytic streptococcus infection, the result of a congenital susceptibility, the result of climatic and meteorological factors, a combination of these or due to an agent as yet undiscovered remains for further studies to determine. Our experience and that of others indicates that in the majority of instances the development of the acute rheumatic fever syndrome is related to a preceding hemolytic streptococcus infection. At least it is certain that we have not seen an epidemic incidence of rheumatic fever without a preceding high incidence of hemolytic streptococcus infections. It therefore appears logical to attempt prophylaxis of rheumatic fever in those areas of high incidence by reducing or preventing the hemolytic streptococcus infections and the associated respiratory diseases.

This paper will deal only with one phase of the AAF Rheumatic Fever Control Program and will be limited to a report on the use of sulfadiazine prophylaxis. In March 1943 Painton³ at the Greensboro Army Air Base, while using sulfadiazine for the prophylaxis of meningococcic meningitis, obtained incidental evidence that scarlet fever could be controlled by this method.

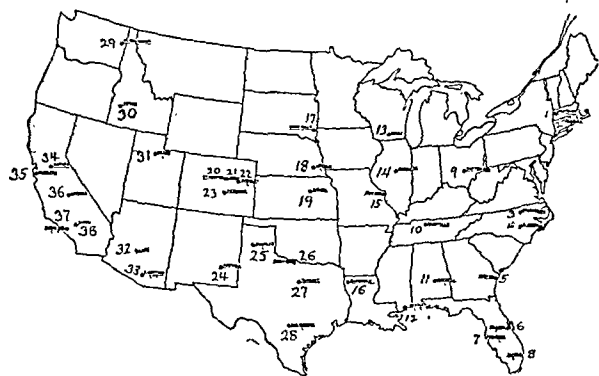


Fig. 1.—Army Air Forces hospitals cooperating in the Rheumatic Fever Control Program, with a notation of special facilities. 1. Westover, Mass. 2. Bradley, Conn. 3. Greensboro, N. C. 4. Seymour-Johnson, N. C. 5. Hunter, Ala. 6. Orlando, Fla. (convalescent). 7. Drew, Fla. (laboratory). 8. Miami, Fla. (convalescent). 9. Patterson, Ohio. 10. Nashville, Tenn. 11. Maxwell, Miss. (laboratory). 12. Keesler, Ala. (laboratory and convalescent). 13. Truax, Wis. 14. Chanute, Ill. 15. Jefferson Barracks, Mo. 16. Barksdale, La. 17. Sioux Falls, S. D. 18. Lincoln, Neb. (laboratory). 19. Salina, Kan. 20. Fort Logan, Colo. 21. Lowry, Colo. 22. Buckley, Colo. (laboratory). 23. Peterson, Colo. 24. Roswell, N. M. 25. Amarillo, Texas (laboratory). 26. Sheppard, Texas. 27. Tarrant, Texas. 28. San Antonio, Texas (laboratory). 29. Fort George Wright, Washington. 30. Gowen, Idaho. 31. Kearns, Utah (laboratory). 32. Luke, Ariz. 33. Davis-Monthan (laboratory and convalescent). 34. Mather, Calif. 35. Hamilton, Calif. 36. Hammer, Calif. 37. Santa Ana, Calif. (laboratory and convalescent). 38. March, Calif.

The control of a scarlet fever epidemic among Navy personnel by the use of sulfonamides was similarly demonstrated by Watson and his associates⁴ at the same time. Others⁵ have reported favorable effects by the use of small doses of sulfonamides in preventing recurrences of rheumatic fever. Our studies of sulfonamide prophylaxis have been directed toward the determination of optimal dosage, the most effective method of mass

administration and an evaluation of the potential danger of the method. In our experience sulfadiazine, because of its low toxicity and availability, has been the drug of choice.

SULFADIAZINE PROPHYLAXIS

A number of carefully controlled studies were conducted, in which different methods of administration

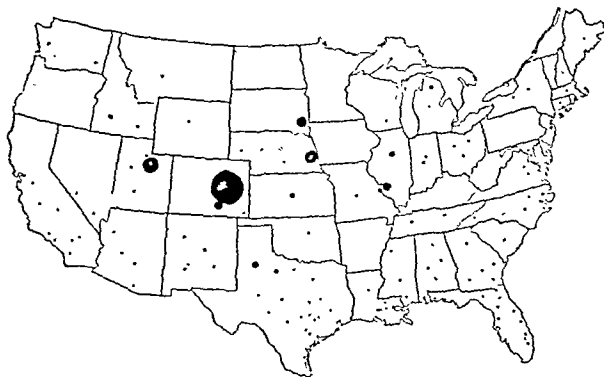


Fig. 2.—Distribution of rheumatic fever in Army Air Forces installations for 1943. The open circles represent posts with rates less than one per thousand annually. The diameter of solid circles is proportional to rates at posts exceeding 1 per thousand annually.

were used and the amount of the drug given was varied. The treated groups and control groups were approximately the same size and represented as nearly as possible identical epidemiologic units. Most of the graphs shown are based on reduction of hospital admissions for respiratory disease and, at these posts, approximately 50 per cent of the admissions for respiratory disease showed clinical and laboratory evidence of significant hemolytic streptococcus infection.

Four grams of sulfadiazine given in a forty-eight hour period produces a definite but very brief reduction in hospital admissions for respiratory disease (figure 4,

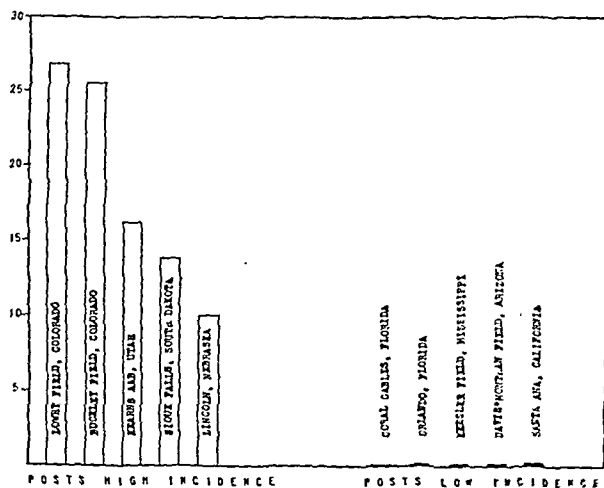


Fig. 3.—A comparison of yearly incidence rates for rheumatic fever in two selected groups of AAF installations.

group B, approximately 5,000 troops). Six grams given over a period of three days promptly reduces the hospital admissions approximately 75 per cent for a period of about twelve days (fig. 4, group A, approximately 5,000 troops). One gram daily effects a continuous reduction in hospital admissions for respiratory disease and is somewhat more effective than the intermittent method if it is not properly timed (fig. 5, 5,000

3. Painton, J. F.: Personal communication to the author.

4. Watson, R. F.; Schwentker, F. F.; Fetherston, J. E., and Rothbard, S.: Sulfadiazine Prophylaxis in an Epidemic of Scarlet Fever, *J. A. M. A.* **122**: 730-733 (July 10) 1943.

5. Hansen, A. E.; Platon, R. V., and Dwan, P. F.: The Prolonged Use of a Sulfonamide Compound in the Prevention of Rheumatic Recurrences in Children: Evaluation Based on a Four Year Study on Sixty-Four Children, *Am. J. Dis. Child.* **64**: 963-976 (Dec.) 1942. Kuttner, A. G.: The Prevention of Rheumatic Recurrences, *New York State J. Med.* **43**: 1941-1947 (Oct 15) 1943. Coburn, A. F., and Moore, L. V.: Prophylactic Use of Sulfonamides in Streptococcal Respiratory Infections, with Especial Reference to Rheumatic Fever, *J. Clin. Investigation* **18**: 147-155 (Jan.) 1939. Thomas, C. B.: The Prophylactic Treatment of Rheumatic Fever by Sulfanilamide, *Bull. New York Acad. Med.* **18**: 508-526 (Aug.) 1942.

troops in each group). The efficacy of 1 Gm. daily is clearly shown in relation to the control group in figure 6 (9,000 troops).

Striking reductions are obtained for total dispensary admissions by the same method (fig. 7, 9,000 troops). At two large bases almost identically satisfactory results

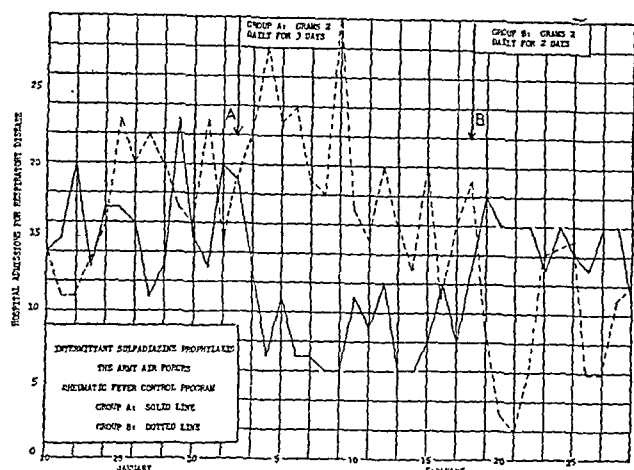


Fig. 4.—Sulfadiazine prophylaxis: A comparison of the effect of varying total dosage in control groups each containing 4,800 troops. Group A, solid line, 2 Gm. daily for three days. Group B, broken line, 2 Gm. daily for two days.

have been obtained in the reduction of the number of admissions to hospitals and dispensaries by the use of 0.5 Gm. daily.

When the effects of sulfadiazine prophylaxis are considered only in relation to streptococcal infections, the prophylactic value is even more dramatic, as might be expected (fig. 8, 4,800 troops in each group). This experience also indicates that intermittent and continuous dosage may be equally effective if properly timed. It further points out that, after a lapse of considerable time, prophylaxis when repeated on the same groups is fully as effective as the first time. Another post experience is shown in figure 9.

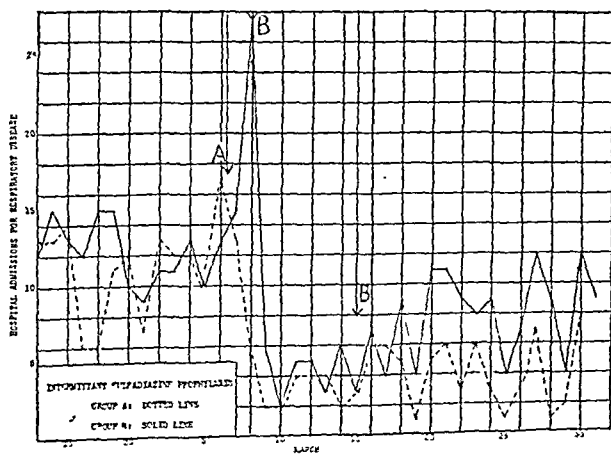


Fig. 5.—Sulfadiazine prophylaxis: A comparison of daily and intermittent dosage in two epidemiologically similar groups of 4,800 troops. Group A, broken line, 1 Gm. daily for twenty-two days; group B, solid line, 2 Gm. daily for two days.

With regard to the reduction in rheumatic fever, total figures are not yet available; but it appears from considerable data at hand that the reduction in rheumatic fever parallels the reduction in respiratory diseases and streptococcal infections.

DRUG REACTIONS

Painton³ at Greensboro Army Air Base in March 1943 gave each of 18,000 troops 4 Gm. of sulfadiazine in twenty-four hours without serious reactions.

Lee⁶ at Santa Ana Army Air Base gave each of 25,000 troops 2 Gm. in one dose and observed thirteen severe reactions. No deaths occurred. Seven had fever and all 13 had skin reactions. There were 15 additional cases of mild skin reactions. The very severe reactions occurred in individuals subsequently found to have a previous history of sulfonamide reactions that were not reported. Our special study of reactions has been limited to approximately 40,000 troops on which full reports are available. There were no deaths. Thirteen individuals lost some days of duty and 33 had mild manifestations not resulting in loss of time from duty. There were no renal complications and no evidence of neutrophilic leukopenia. The major disabilities were skin lesions occurring between the first and sixteenth days of administration of the drug. These disappeared when the drug was discontinued. In the only 2 indi-

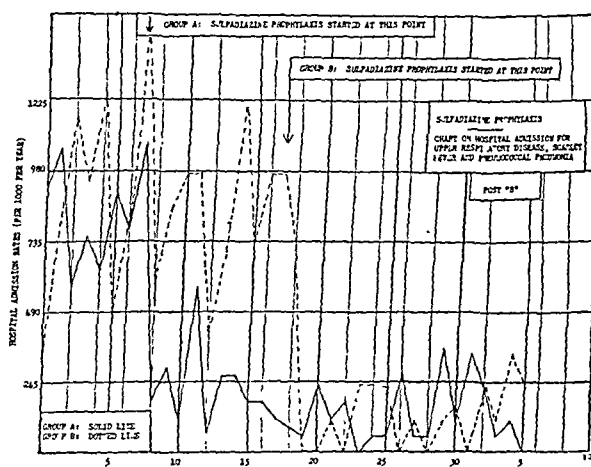


Fig. 6.—Sulfadiazine prophylaxis: The effect of a daily dose of 1 Gm. on hospital admissions for upper respiratory disease, scarlet fever and pneumococcal pneumonia. The two control groups represent 9,000 men. Group A, solid line; group B, broken line.

viduals who developed high febrile reactions there was a history of previous sulfonamide reactions which had not been reported. One patient developed anemia, hemolytic in type, with prompt recovery following transfusions.

Of the 40,000 in this group, only 0.03 per cent lost time from duty and only 0.12 per cent had any type of reaction. Painton's experience with larger doses was similar. The reason for the increased incidence and severity of reactions observed by Lee at Santa Ana is not clear. Larger single doses have been used at a number of AAF installations for prophylactic purposes without a similar result. It is, of course, possible that by chance twice as many reactors were present in his group. However, the possibility of more sunshine at Santa Ana in consideration of the photosensitizing properties of sulfadiazine should be considered. At any rate it is quite obvious that the total hazard is very small and that, if known sulfonamide reactors are eliminated, doses of 0.5 to 1 Gm. daily can be given with almost complete lack of risk.

6. Lee, R. V. A.: Personal communication to the author.

COMMENT

Our army of seven million troops spent in excess of fourteen million days in the hospital last year because of common respiratory diseases. In addition to this time there were the inevitable number of complications and deaths as well as additional millions of man days lost from duty. If our experience with sulfadiazine prophylaxis holds true, it is a conservative estimate that 50 to 75 per cent of this tremendous loss could be avoided.

One question that will immediately present itself concerns the possibility of producing dangerous strains of sulfonamide resistant organisms. The answer cannot be given with complete certainty at this time. However, it is well known that patients who have had prophylaxis in the past respond equally well to sulfadiazine when an acute illness develops. Furthermore, as shown in figure 8, approximately ten thousand troops responded as well to a second period of prophylaxis as to the first. If sulfadiazine prophylaxis is to result in the production of dangerous sulfonamide resistant

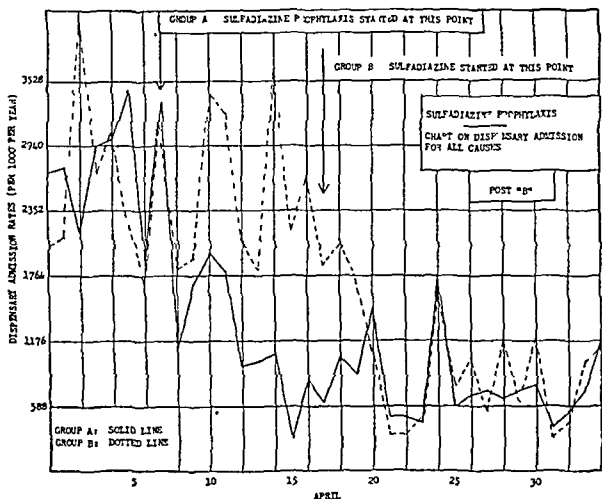


Fig. 7.—Sulfadiazine prophylaxis. The effect of a daily dose of 1 Gm. on dispensary admissions for the same group shown in figure 6. Group A, solid line; group B, broken line.

strains, it would seem reasonable to expect that some evidence of this would already have appeared in our repeated experience on thousands of troops. To the best of our knowledge, such evidence has not yet appeared. Further bacteriologic studies are being directed toward this phase of the investigation.

The possibility of individuals becoming sensitized to the drug on a mass scale has been considered. Repeated periods of prophylaxis on the same groups have failed to demonstrate any developing sensitivity. Following the feeding of sulfonamides, late lesions developing in rats have been reported.⁷ Prophylactic doses used clinically are so minute when considering body weight that similar findings in human beings appear extremely unlikely. Further studies on animals, using comparable amounts of the drug based on body weights or blood levels over varying periods of time, should be undertaken. Three months has been the longest continuous period of prophylaxis used by us.

7. Endicott, K. M., Kornberg, A., and Daft, F. S.: Lesions in Rats Given Sulfathiazole, Sulfadiazine, Sulfanilamide, Sulfamerazine, Sulfapyridine or Acetylsulfadiazine in Purified Diets, Pub Health Rep 59: 49 55 (Jan. 14) 1944.

CONCLUSIONS

1. Acute rheumatic fever shows a striking geographic variation in its distribution, as indicated by the incidence rates per thousand troop population in the various geographic areas.
2. Acute rheumatic fever occurring in high incidence during this study in every instance has been preceded by a high incidence of hemolytic streptococcus infections.

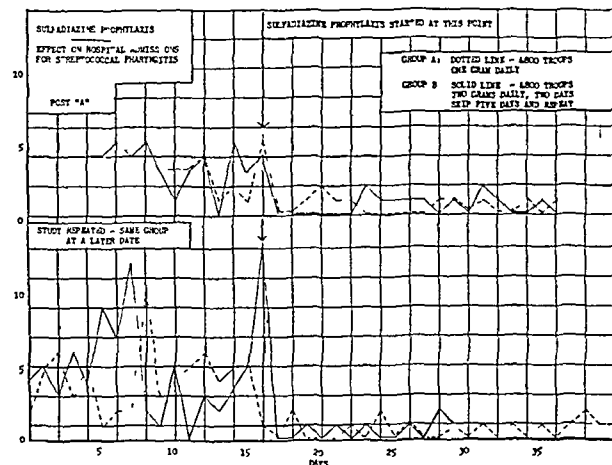


Fig. 8.—Sulfadiazine prophylaxis: The effect of continuous and intermittent sulfadiazine administration on hospital admissions for streptococcal pharyngitis. The same group of 9,600 men was used in each of the two studies, which were done at an interval of one month.

3. A 50 to 75 per cent reduction in the incidence of respiratory diseases and streptococcal infections has been accomplished by the use of sulfadiazine prophylaxis under carefully controlled conditions and on a significantly large troop population. No serious drug reactions occurred.
4. From the partial data at hand, it appears that the reduction in rheumatic fever parallels that of respiratory and streptococcal diseases.

HOSPITAL ADMISSIONS	NUMBER OF CASES	
LOBAR PNEUMONIA	0	
ATYPICAL PNEUMONIA	4	
GONORRHEA	19	
RHEUMATIC FEVER	10	
UPPER RESPIRATORY DISEASE	23	
TOTAL HOSPITAL ADMISSIONS CONTAGIOUS DISEASES	42	
DISPENSARY ADMISSIONS	177	

SULFADIAZINE PROPHYLAXIS	
TREATED GROUP	2103 MEN - 1 GRAM SULFADIAZINE DAILY
CONTROL GROUP	2003 MEN - NO MEDICATION

STATION C	
-----------	--

Fig. 9.—Sulfadiazine prophylaxis: Hospital and dispensary admissions for a twenty one day period from a group of 2,103 men receiving 1 Gm daily as compared with a control group receiving no medication.

5. The possibility of utilizing these prophylactic methods, thus saving millions of hospital days, avoiding serious complications and adding millions of effective man days to the war effort, should be given consideration.

Office of the Air Surgeon.

THE PREVENTION OF RESPIRATORY TRACT BACTERIAL INFECTIONS

BY SULFADIAZINE PROPHYLAXIS IN THE UNITED STATES NAVY

COMMANDER ALVIN F. COBURN, MC-V(S) U.S.N.R.
WASHINGTON, D. C.

The struggle between bacterial flora and the human host is a continuous one. Survival of the two has been determined by a balanced relationship. In time of war, living conditions of the host are such that this relationship is disturbed, and the balance is now already tipped in favor of respiratory pathogens. In the first year of World War II a significant development in the armed forces was the increasing morbidity rate from respiratory infections, and in the U. S. Navy the majority of the important respiratory diseases were caused by the hemolytic streptococcus. At U. S. naval training centers situated in Northern states these infections have handicapped recruit training. The experiences of one of these stations will illustrate the importance of streptococcal infections in the U. S. Navy.

Early in 1943 a training center with an average strength of 43,000 had an outbreak of measles. This was followed by many types of respiratory infections, including in one year 4,973 cases of scarlet fever, 1,375 cases of rheumatic fever, 1,383 cases of pneumonia, 131 cases of meningitis and at least 50,000 infections of the nasopharynx or tonsils. During the summer months the activity of the meningococcus and the pneumococcus subsided. However, the hemolytic streptococcus maintained its pathogenicity, and late in 1943 this bacterium manifested an increased virulence. It became highly communicable; it produced rather intense scarlet fever; it precipitated severe rheumatic attacks in susceptible subjects; it became invasive. The acquisition of invasiveness by this micro-organism was accompanied by the rapid development of lytic phenomena in the patient, e. g. vomica formation, pericarditis, empyema and other suppurative lesions. Furthermore, strains of this bacterium identified serologically as types 17, 1 and 19 maintained their pathogenicity when transplanted by carriers to other geographic environments and even initiated streptococcal outbreaks at naval activities situated in Southern states.

ECONOMIC LIABILITIES OF STREPTOCOCCIC INFECTIONS

Each man who is taken up on the sick list with a streptococcal infection becomes a liability to the Navy. Not only are his services lost but, in addition, the services of two well persons are required to care for him. The duration of his time on the sick list is determined by the streptococcus syndrome manifested. The average man-days loss for common diseases induced by the hemolytic streptococcus in 1942 and 1943 is presented in table 1. This table shows that the average time spent on the Sick List for scarlet fever was 21.9 days, for rheumatic fever 92.1, for pneumonia 26.4 and for tonsillitis 5.7 days.

From the Bureau of Medicine and Surgery, Navy Department. U. S. Navy Epidemiology Units numbers 67 and 89 supplied data used in this report.

Read before the joint meeting of the Section on Practice of Medicine and the Section on Experimental Medicine and Therapeutics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

Bacterial respiratory tract infections are costly not only in man-days loss but also in dollars expended. For example, the liability incurred for just four of these diseases at a single training station is conservatively estimated as shown in table 2.

A PROGRAM FOR THE CONTROL OF STREPTOCOCCIC INFECTIONS

The Navy's enormous loss to *Streptococcus haemolyticus* was only one of the compelling reasons for instituting a streptococcus control program. For military and civilian welfare it became essential to prevent the dissemination of the streptococcus among naval personnel, to prevent the induction of rheumatic fever with the development of incapacitating heart disease, to prevent the invasion of the streptococcus into deep tissues with the formation of suppurative lesions and to prevent the spreading of this highly virulent organism from one naval activity to another. To attain these objectives the U. S. Navy instituted a long term streptococcus control program in November 1943.

The first objective in this program was to check the dissemination of respiratory pathogens in the winter of 1944. For this purpose the use of prophylactic doses

TABLE 1.—Average Days Spent on the Sick List in 1942-1943 for Diseases Initiated by Respiratory Tract Pathogens

Diagnosis	Man-Days Loss
Scarlet fever	21.9
Tonsillitis, acute	5.7
Pharyngitis, acute	5.5
Catarrhal fever, acute	4.9
Laryngitis, acute	6.2
Bronchitis, acute	8.5
Tracheitis, acute	6.8
Tracheobronchitis, acute	10.5
Rhinitis, acute	5.2
Angina, Vincent's	8.4
Sinusitis, acute, group (paranasal, sinusitis: ethmoidal, frontal, maxillary, sphenoidal)....	15.8
Otitis media, acute	10.8
Mastoiditis, acute	60.6
Pneumonia, bronchial	26.4
Pneumonia, lobar	25.8
Cerebrospinal fever (meningococci)	39.5
Rheumatic fever	92.1

of sulfadiazine seemed the method of choice. Other investigators had previously indicated the effectiveness of sulfonamide prophylaxis;¹ nevertheless, it seemed wise to control the administration of sulfadiazine with caution. To test the applicability of mass prophylaxis under controlled conditions and to determine a standard prophylactic dose of sulfadiazine, programs were designed for five large Northern training stations with high respiratory disease rates. Groups of trainees were then selected to receive sulfadiazine prophylaxis and comparable groups to serve as untreated controls. At each station these groups were placed under the surveillance of a Navy epidemiology unit consisting of two to five medical officers and four to ten pharmacist

1. Watson, R. F.; Schwentker, F. F.; Fetherston, J. E., and Rothbard, S.: Sulfadiazine Prophylaxis in an Epidemic of Scarlet Fever, *J. A. M. A.* 122:730-733 (July 10) 1943. Thomas, C. B., and France, R.: Preliminary Report of Prophylactic Use of Sulfanilamide in Patients Susceptible to Rheumatic Fever, *Bull. Johns Hopkins Hosp.* 64:67-77 (Jan.) 1939. Thomas, C. B.; France, R., and Reichman, F.: The Prophylactic Use of Sulfanilamide in Patients Susceptible to Rheumatic Fever, *J. A. M. A.* 116:551-560 (Feb. 15) 1941. Hansen, A. E.; Platow, R. V., and Dwan, P. F.: Prolonged Use of a Sulfonamide Compound in Prevention of Rheumatic Recurrences in Children: Evaluation Based on Four Year Study of 64 Children, *Am. J. Dis. Child.* 64:963-976 (Dec.) 1942. Kuttner, A. G., and Reyersbach, G.: The Prevention of Streptococcal Upper Respiratory Infections and Rheumatic Recurrences in Rheumatic Children by the Prophylactic Use of Sulfanilamide, *J. Clin. Investigation* 22:77-85 (Jan.) 1943. Chandler, Caroline A., and Tausig, Helen B.: Sulfanilamide as a Prophylactic Agent in Rheumatic Fever, *Bull. Johns Hopkins Hosp.* 72:42-53 (Jan.) 1943.

mates, all of whom had been trained in epidemiology. The duties of each unit included the following:

- (a) To supervise the distribution of sulfadiazine by line officers.
- (b) To administer the collection of clinical data on all men reporting to sick bay with respiratory symptoms.

TABLE 2.—*Liability Incurred for Four Diseases at One Training Station*

Disease	No. of Cases	Estimated Days Lost
Scarlet fever	4,973	168,908
Rheumatic fever	1,375	126,637
Pneumonia	1,383	36,511
Tonsillitis or pharyngitis.....	50,000	285,000
Total days lost to four diseases.....		557,056
Days consumed by personnel caring for these diseases.....		1,114,114
Estimated cost in salaries.....		\$5,000,000
Estimated cost in pensions for disabilities.....		\$10,000,000
Total cost for four streptococcus manifestations at one naval training station.....		\$15,000,000
Total man-days loss for four streptococcus manifestations at one naval training station.....		1,671,171

(c) To check the diagnoses of all men receiving sulfonamide compounds who were admitted to the sick list with respiratory infections.

(d) To obtain throat cultures on all such individuals and a sample (10 per cent) of individuals contracting respiratory infections in untreated control groups.

(e) To isolate the beta hemolytic streptococcus and ship these organisms in pure culture to the National Naval Medical Center, Bethesda, Md., for grouping, typing and testing of drug fastness.

On Dec. 1, 1943 this controlled program was initiated at five training stations. Data on the incidence of respiratory infections in the "treated" and control groups were collected for three months. With the accumulation of these data the effectiveness of mass prophylaxis was manifest. It was then decided to extend the program to three other naval activities experiencing a high incidence of streptococcal infections

TABLE 3.—*Monthly Morbidity for Certain Diseases Activity A*

Rates per Thousand Men During the Winters of 1943 and 1944

Diagnosis	1943			1944		
	January	February	March	January	February	March
Tonsillitis.....	15.1	8.6	25.8	25.0	13.0	2.9
Catarrhal fever.....	75.1	58.2	76.3	54.2	26.6	5.6
Scarlet fever.....	0.5	2.8	9.3	16.6	4.4	0.8
Rheumatic fever.....	3.5	3.9	3.2	8.6	4.3	1.3
Septic sore throat.....	0.0	0.0	0.1	3.5	1.6	0.5
Pneumonia, bronchial.....	0.0	0.0	0.0	1.6	3.4	0.4
Pneumonia, lobar.....	0.5	0.0	0.6	1.3	1.7	0.2
Pneumonia, atypical.....	2.1	2.7	5.2	0.1	0.3	0.5
Sinusitis.....	3.7	3.6	5.1	6.7	5.0	1.8
Pharyngitis.....	1.7	0.8	4.5	1.4	6.0	1.3
Laryngitis.....	0.2	0.4	0.4	0.9	0.5	0.2
Otitis media, acute.....	2.3	3.2	6.3	6.0	5.6	1.8
Vincent's angina.....	2.5	2.0	1.1	0.1	0.0	0.5
Bronchitis.....	0.6	0.4	1.1	0.4	0.9	0.4
Meningitis.....	0.1	0.6	0.2	1.7	0.2	0.1
Mastoiditis, acute.....	0.0	0.0	0.1	0.4	0.2	0.1

and to discontinue the use of untreated controls in the five naval activities at which the sulfadiazine program was already in operation. Continuous mass prophylaxis was accordingly extended to about fifty camps of eight naval activities, and this program was continued throughout the spring months. The effectiveness of the overall program will be appraised in a forthcoming monograph.^{1a} The present paper is a preliminary report limited to observations on sulfadiazine prophylaxis instituted under three different conditions at three naval training camps.

THE EFFECT OF SULFADIAZINE PROPHYLAXIS INITIATED DURING A STREPTOCOCCIC OUTBREAK AT ACTIVITY A

Naval Activity A, situated in the city of Chicago, had experienced a high rate of infections occasioned by the great expansion of intensive training with a rapid turnover in personnel. Early in the winter its training program was seriously handicapped by a high incidence of streptococcal infections, which were subsequently identified as due to types 17, 3 and 30. During December 1943 more than 25 per cent of the station's complement were admitted to the sick list with respiratory infections, in all 27,966 man-days, or about 10 per cent of the available man power, were lost. The incidence of these infections continued to be high in January, and a large number of men developed rheumatic fever. By February 1944 the hospital admission rates² for respiratory diseases and sequelae had reached extraordinary heights: for catarrhal fever 988, for tonsillitis 426, for scarlet fever 171 and for rheumatic fever 70. The urgency of the situation and the expectancy of an increase in these rates during February and March

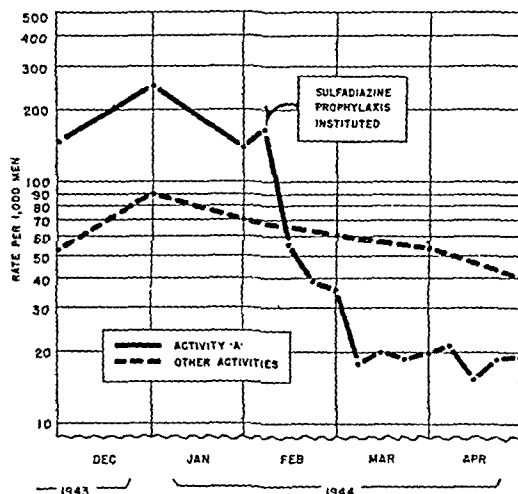


Chart 1.—A comparison of the monthly morbidity rates for respiratory tract infections at Activity A with those of other naval activities in the Chicago area.

were cogent reasons for placing all station personnel on sulfadiazine prophylaxis.

Results of Sulfadiazine Prophylaxis.—The institution of prophylaxis, 1 Gm. of sulfadiazine daily, on February 8 was followed by a rapid fall in the incidence of disease. For example, the scarlet fever rate² fell weekly to 70, to 45 and to 0 during the third week. The rheumatic fever rate rose during the first week of prophylaxis to 87 and then fell progressively by weeks to 45, 45, 19 and 6. The fall in incidence of respiratory diseases observed in February became even more pronounced in March and April 1944. That this was not to be expected from the experience of 1943 is shown in table 3. And it is seen in table 4 that this phenomenal change was not observed at other naval activities in Chicago during March and April 1944. A comparison of the monthly morbidity rates for respiratory infections at Activity A receiving sulfadiazine prophylaxis after February 8 and for five other naval activities in Chicago receiving no prophylaxis is shown in chart 1.

In summary, the institution of sulfadiazine prophylaxis 1 Gm. daily to all hands at Activity A on

February 8 during a severe streptococcic outbreak was accompanied by a precipitous, contraseasonal decline in streptococcic infections and was followed by a striking drop in the incidence of rheumatic fever.

EFFECT OF SULFADIAZINE PROPHYLAXIS INSTITUTED IN HALF A CAMP AT THE ONSET OF A SCARLET FEVER OUTBREAK

Camp 1 of a naval training station had served as an untreated control group for the prophylactic program during the early winter months of 1943-1944. The

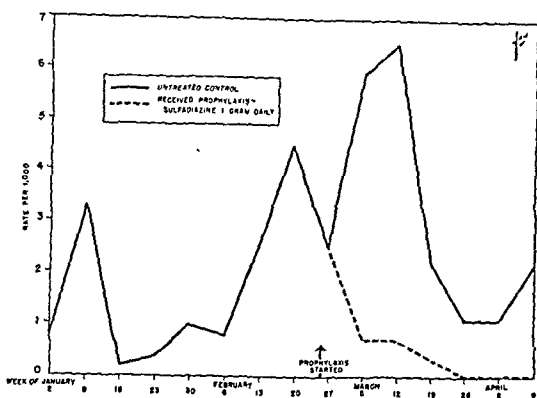


Chart 2.—The effectiveness of sulfadiazine prophylaxis as reflected by the incidence of scarlet fever in Camp 1 during the winter and spring months of 1944.

incidence of streptococcic infections among these 5,000 men had been moderate during December and January. About the middle of February the scarlet fever rate began to rise rapidly, and this was accompanied by a decided increase in the occurrence of other streptococcic respiratory diseases. Most of these infections, irrespective of the presence or absence of a scarlatinal rash, were caused by hemolytic streptococcus group A, type 19. On February 25 one half of the complement of this camp was placed on a prophylactic dose of 1 Gm. of sulfadiazine daily; the other half remained untreated. The effectiveness of sulfadiazine in preventing further

TABLE 4.—Acute Respiratory Tract Infections* at Various Naval Activities in Chicago
Admission Rates per Thousand Strength, Winter of 1943-1944

Naval Activity in Chicago	1943		1944			
	November	December	January	February	March	April
A	146	254	130	74	19	19
B	176	145	210	89	89	51
C	64	71	61	49	54	35
D	40	71	64	44	33	26
E	27	83	61	76	51	43
F	17	100	39	52	46	48

* Includes: tonsillitis, acute; pharyngitis, acute; catarrhal fever, acute; bronchitis, acute; laryngitis, acute; Vincent's angina; pneumonia, all forms; scarlet fever; septic sore throat; influenza; rheumatic fever.

spread of this highly communicable strain of hemolytic streptococcus in recruits receiving prophylaxis is shown in chart 2.

EFFECTIVENESS OF SULFADIAZINE IN PREVENTING IMPLANTATIONS OF HEMOLYTIC STREPTOCOCCUS IN A RECRUIT CAMP

The foregoing observations indicated that 1 Gm. of sulfadiazine administered daily was effective in checking a streptococcic outbreak, either when well advanced (Activity A) or in its early stage (Camp 1). The following observations will serve to show that as little as 0.5 Gm. of sulfadiazine administered daily prevents the implantation of the hemolytic streptococcus in a

recruit group (Camp 2) with a complete turnover of personnel every four to six weeks.

Camp 2 was situated about 1 mile from Camp 1 on the same naval training station. In November 1943, when the incidence of streptococcic infections was low, this camp was divided into two groups for the purpose of this investigation. All even numbered companies were placed in group A, which received no chemo-

TABLE 5.—The Incidence of Respiratory Infections (Probably Hemolytic Streptococcus) in Camp 2

Four Week Period Ended	All Respiratory Illness with Positive Hemolytic Streptococcus Cultures				Σ/σ	P
	A. Control		B. Treated			
	Number Cases	Rate per 1,000	Number Cases	Rate per 1,000		
2/6/44	77	46.88	9	5.27	7.43	<0.0001
3/5/44	113	79.02	9	6.05	9.60	<0.0001
4/2/44	...	....	18	6.88	....	.....

TABLE 6.—The Incidence of Frank Streptococcic Infections in Camp 2

Four Week Period Ended	Scarlet Fever, Tonsillitis and Pharyngitis				\bar{x}/σ	P
	A. Control		B. Treated			
	Number Cases	Rate per 1,000	Number Cases	Rate per 1,000		
2/6/44	26	15.83	2	1.17	4.56	<0.0001
3/5/44	64	44.75	2	1.34	7.06	<0.0001
4/2/44	..	.....	3	1.15	..	.....

prophylaxis, and all odd numbered companies were placed in group B, which received 0.5 Gm. of sulfadiazine daily. On March 1 both groups were placed on a prophylactic regimen of sulfadiazine 1 Gm. daily. The incidence of respiratory symptoms and respiratory diseases of groups A and B is shown in chart 3. Data on the incidence of probable and frank hemolytic

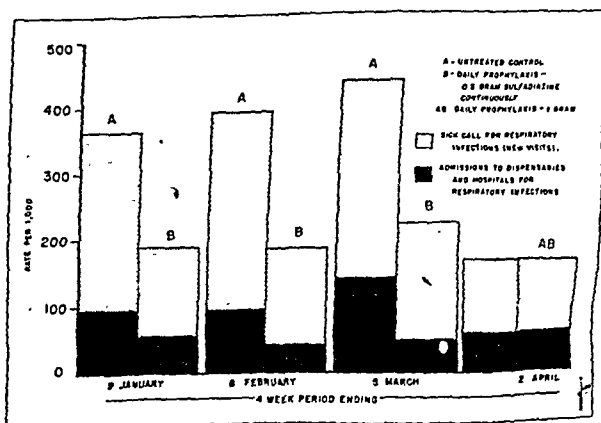


Chart 3.—The effectiveness of continuous sulfadiazine prophylaxis in preventing respiratory tract infections in Camp 2.

streptococcus infections of the two groups are summarized in tables 5 and 6.

It is seen in chart 3 and tables 5 and 6 that the group receiving sulfadiazine prophylaxis had a low incidence of respiratory infections. This low incidence in group B was maintained for three months, and perhaps greater protection was afforded during March, when the prophylactic daily dose of sulfadiazine was increased from 0.5 to 1.0 Gm. The incidence of sick call visits for respiratory symptoms in the untreated group was twice

that in the treated group, and the incidence of respiratory diseases requiring bed care in the untreated group was about three times that in the treated group. In both the difference in incidence between untreated and treated groups is statistically significant. This difference is even more striking for streptococcal infections. The incidence of respiratory disease probably caused by the hemolytic streptococcus in the untreated group was eleven times the incidence of the treated group. Frank streptococcal infections in the untreated group had an incidence twenty-four times that of the treated group.

EVALUATION OF THE POTENTIAL LIABILITIES AND ASSETS OF SULFADIAZINE PROPHYLAXIS

When this program was initiated, there appeared to be three potential dangers inherent in sulfadiazine prophylaxis: (a) sensitization of patients to sulfonamide compounds, (b) induction of severe, irreversible drug reactions, (c) development of drug fastness by respiratory pathogens.

Sensitization of Patients.—Mild evanescent dermal drug sensitization phenomena occurred in all three groups receiving sulfadiazine. The incidence of symptoms ascribed to the drug varied between 0.2 and 0.7

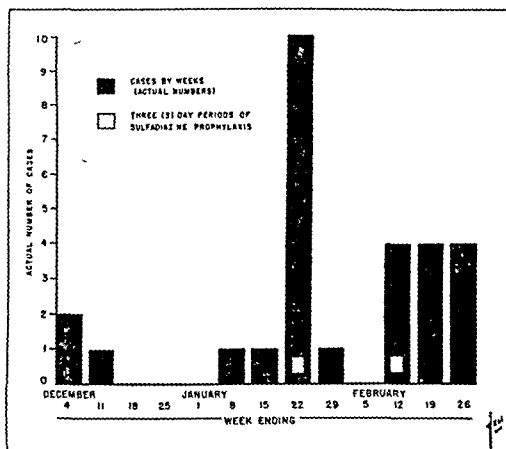


Chart 4.—The ineffectiveness of two short courses of sulfadiazine in checking an outbreak of scarlet fever at a small naval activity.

per cent. Approximately half of these reactors when retested had no drug symptoms and were replaced on the prophylactic program. The large majority of all reactions occurred in the second and third weeks of prophylaxis following the total dosage of 7 to 20 Gm. of sulfadiazine. The reinstitution of prophylaxis in groups who had been without sulfadiazine for a period of one to four weeks did not increase the incidence of drug reactions. A few individuals who had manifested sensitivity to sulfonamide compounds and who subsequently contracted severe respiratory infections were treated with penicillin. The collected findings indicated that a small percentage of persons have an idiosyncrasy to sulfonamide compounds administered in therapeutic or prophylactic doses and that sulfadiazine prophylaxis per se does not sensitize.

Severe Irreversible Drug Reactions.—Dangerous untoward reactions occurred in 0.01 per cent of individuals receiving sulfadiazine prophylaxis. These were of two types and about equally divided between exfoliative dermatitis and granulocytopenia. With supportive treatment these disease processes appeared reversible. The administration of therapeutic doses of sulfonamide to one man with a sulfonamide rash and bronchitis was

followed by death. This was the only instance in which death occurred. The autopsy showed lymphadenopathy, which on microscopic examination proved to be leukemia.

Development of Drug Fastness by Respiratory Pathogens.—Fastness to sulfadiazine was apparently not initiated during the first four months of this prophylactic program. The evidence is:

1. There was no increase in the prevalence of any serologic type of hemolytic streptococcus in the groups on prophylaxis.
2. There was no increase in the proportion of hemolytic streptococci in the throat flora of individuals throughout the period of prophylaxis.
3. There was no increase in streptococcal morbidity throughout the period of prophylaxis.
4. There was no difficulty in obtaining a satisfactory therapeutic effect from sulfadiazine in individuals who contracted streptococcal infections while receiving prophylaxis.

In summary, the only liability incurred in this program was the development of a few severe drug reactions, 1 in 10,000 individuals receiving prophylaxis.

The gains from the program included prevention of disabilities, saving in man-days loss and a reduction in the costs for care of the sick and for pensions. The size of these gains was proportional to the incidence of bacterial infections of the respiratory tract. Among recruits with a high incidence of infections it was estimated that 343 man-days were saved per thousand weekly from bacterial infections. Most of these man-days were saved through the prevention of streptococcal infections. Since these infections are prone to cause debilitating sequelae, their prevention obviously created enormous benefits to Naval personnel and to the United States government in a state of war.

COMMENT

A number of observers have pointed out the effectiveness of a short course of sulfadiazine prophylaxis in checking outbreaks of meningococcal infections.³ This measure not only breaks the epidemic process but also eliminates the meningococcus from the throat flora of carriers. Because of this a misconception has arisen in the handling of streptococcal outbreaks. Sulfadiazine administered for a few days, either in prophylactic or in therapeutic doses, does not check a streptococcal outbreak and has little or no effect on the throat flora of individuals in the carrier state. This fact was demonstrated by a small naval activity experiencing an outbreak of scarlet fever. Sulfadiazine was given for three days in January with apparently good results; however, the outbreak recurred in February when another three day period of prophylaxis was administered with little effect. All personnel were subsequently placed on a continuous prophylactic program of sulfadiazine 1 Gm. daily, early in March. The streptococcal outbreak then subsided and only 2 new cases of scarlet fever occurred in the following ten weeks. The ineffectiveness of short courses of sulfadiazine at this activity is shown in chart 4. This experience illustrated that a three day course of prophylaxis, which will effectively check a meningococcal outbreak, is not adequate for preventing streptococcal infections. The presence of sulfadiazine on the surface of mucous membranes prevents

3. Cheever, F. S.; Breese, B. B., and Upham, H. C. The Treatment of Meningococcus Carriers with Sulfadiazine, *Ann. Int. Med.* 19: 602-608 (Oct.) 1943. Thomas, H. M., Jr. Meningococcal Meningitis and Septicemia. Report of Outbreak in Fourth Service Command During Winter and Spring of 1942-1943, *J. A. M. A.* 123: 264-272 (Oct. 2) 1943. Kuhn, D. M.; Nelson, C. T.; Feldman, H. A., and Kuhn, L. R. The Prophylactic Value of Sulfadiazine in the Control of Meningococcal Meningitis, *ibid.* 123: 335-339 (Oct. 9) 1943.

implantation of hemolytic streptococci but does not modify the streptococcus flora already implanted.

The exact concentration of sulfadiazine in the nasopharyngeal secretions required to prevent implantation of bacterial respiratory pathogens is still unknown. In the course of the present studies it was found that individuals receiving a daily dose of 1 Gm. of sulfadiazine had blood values ranging between 2.6 and 1.7 with a median of 2.2 mg. per hundred cubic centimeters and that with a daily dose of 0.5 Gm. the blood values ranged between 1.8 and 0.8 with a median of 1.4 mg. per hundred cubic centimeters. The findings of others⁴ have shown that the concentration of sulfadiazine in the secretions of the upper respiratory tract is about 60 per cent of blood levels. The observations made in Camp 2, therefore, indicate that these secretions containing less than 1 mg. of sulfadiazine per hundred cubic centimeters were adequate to prevent the implantation of most bacterial respiratory tract pathogens.

SUMMARY

1. The United States Navy is engaged in a long term program for the control of streptococcal infections and their disabling sequelae.

2. One component of this program involves mass prophylaxis with sulfadiazine.

3. Prophylactic doses of this drug were given continuously to about 250,000 naval trainees between December 1943 and April 1944.

4. This preliminary report deals with observations on only 30,000 men at three camps.

5. These observations indicate that the continuous ingestion of 1 Gm. of sulfadiazine daily is adequate (a) to check a well advanced streptococcal epidemic, (b) to check a streptococcal outbreak at its onset and (c) to protect 85 per cent of susceptible recruits from implantation with bacterial respiratory pathogens.

6. These observations also suggest that a continuous daily dose of 0.5 Gm. of sulfadiazine (affording a mean level of 1.4 mg. per hundred cubic centimeters in the blood and perhaps 0.8 mg. per hundred cubic centimeters in secretions of the respiratory tract) is almost 85 per cent effective in preventing implantation by *Streptococcus haemolyticus*.

7. The only untoward effect of mass sulfadiazine prophylaxis is the occurrence of evanescent rashes in 0.5 per cent and dangerous constitutional disturbances in 0.01 per cent.

8. Mass sulfadiazine prophylaxis is effective (a) in checking bacterial infections of the respiratory tract, (b) in preventing the development of disabling sequelae caused by these bacteria and (c) in aiding the economy of a nation at war.

ABSTRACT OF DISCUSSION

ON PAPERS OF COLONEL HOLBROOK AND
COMMANDER COBURN

DR. T. DUCKETT JONES, Boston: I have no doubt that the general contentions of both speakers are absolutely true. There can be little doubt that sulfadiazine in dosages as indicated and administered as indicated will definitely affect the illness rates, particularly those caused by hemolytic streptococci. I do not think the question of sensitivity to these drugs is yet answered. Sensitivity may not develop until many months after the cessation of the preventive administrations. That is a serious problem, and I wonder if either speaker had any means whereby he might evaluate the question of development

of sensitivity in any of the men receiving the drug. Commander Coburn showed some stations that were control stations. In my experience there have been great differences in illnesses, so that this type of control must be difficult. Neither presentation showed bacteriologic charts, but apparently the charts included bacteriologic infections. The only data at present with regard to rheumatic fever are those of Colonel Holbrook, and I saw no significant difference in the group as he presented it. In conclusion I should like to suggest that perhaps we may control the major features of streptococcal illness by giving the drug to small groups of men who constitute a single epidemiologic unit and base conclusions on the actual illness experiences in these groups. We know that at least 50 per cent of the men will not need preventive measures. It is possible that the drug can be used intelligently to prevent the maximum amount of disease by giving the drug to the minimum number of men.

CAPTAIN RICHARD G. HODGES, M. C., A. U. S.: In evaluating an epidemiologic experiment on respiratory disease it is necessary to exercise considerable caution because there are a number of factors which can cause considerable variation in the respiratory disease rates. In the military population the seasoning of the troops is extremely important. The living conditions of the troops, particularly as pertain to ventilation and dust, the duties of the troops and finally the inflow of new material into the population may also cause profound changes. It is possible that the mass of Commander Coburn's material makes careful control of these factors somewhat unnecessary. However, to substantiate his contentions I should like to mention my experience at an Army Air Force technical school where a considerable degree of control was possible. The school was almost ideally set up for a controlled experiment, being divided into two teaching shifts of approximately 5,000 men each. The duties, the living conditions and even the recreations of the two groups were identical. They were on different time schedules, and thus mixing between the two was at a minimum. Percentage distributions according to length of stay on the field, according to the length of service and according to age were approximately the same for the two. The inflow of new troops into these two groups was approximately equal. Finally, for the preceding fifteen months component squadrons of the school were found to have behaved similarly toward respiratory disease and to an approximately similar degree. During January both groups showed a progressive rise in rate. On the 2d, 3d and 4th of February the members of one teaching shift received 2 Gm. of sulfadiazine per day. Their rate dropped sharply, while the control group's continued to rise. The drop lasted ten days. Then the other group was placed on 2 Gm. a day for two days and showed a corresponding but somewhat less prolonged response. Finally one group was placed on a continuous dosage of 1 Gm. a day and the other group was placed on 2 Gm. a day for two days, and then that was repeated one week later. Both dropped sharply. The response was greatest in streptococcal infections. The streptococcus disease rate was lowered almost to zero by each administration. Thus I believe that the effectiveness of the treatment with sulfadiazine is established.

COMMANDER ALVIN F. COBURN (MC), U.S.N.R.: There are two points that I should like to mention before the conclusion of this discussion. One is that conditions in naval training camps lend themselves well to controlled studies. Alternate companies can either be given prophylaxis or serve as untreated groups. Accurate data can be obtained. Except for the one program which, as I stated, was instituted during an epidemic at a naval activity here in Chicago, all of the navy studies were controlled. Companies selected in random fashion mingled and slept in the same barracks, used common mess halls and exercised together in common drill halls. These studies in the effectiveness of chemoprophylaxis were made under ideal conditions. The second point, which was mentioned only briefly, is that sulfadiazine prophylaxis was effective in preventing rheumatic fever. The incidence of rheumatic fever among men receiving chemoprophylaxis was 15 per cent of the incidence in control groups. Approximately 85 per cent of the expected rheumatic fever cases appeared to be eliminated by sulfadiazine.

4. Norris, C. M.: Sulfonamides in Bronchial Secretion: The Effect of Sulfonamides in Bronchiectasis, J. A. M. A. 123: 667-670 (Nov. 13) 1943.

DR. ROY W. SCOTT, Cleveland: Are there any advantages of sulfadiazine over sulfathiazole?

COLONEL W. PAUL HOLBROOK, M. C., A. U. S.: Dr. Jones asked about what is being done to determine the question of sensitivity. The possibility of individuals becoming sensitized to the drug has been considered. As yet, evidence for an increasing sensitivity in individuals who are on the prophylactic program is not available. Repeated periods of prophylaxis on the same groups have shown in each instance a decreased number of reactors for the second or third prophylactic period rather than an increase. Once the known positive reactors are eliminated, no further difficulty is encountered during subsequent periods of prophylaxis. We also now have a rather large number of troops who have had prophylactic sulfadiazine and who have subsequently developed an acute illness requiring the administration of sulfadiazine therapeutically. These patients have responded as well as those not having had a prophylactic period. These experiences do not appear compatible with an increasing sensitivity. A long range study is planned by means of recording each individual's prophylactic record on his immunization register, so that in six months or a year a rather large accumulation of information should be available on this subject. I have not used sulfathiazole, largely because of the general reports in the literature as to its increased toxicity, but I have no experience in its use for this type of prophylaxis.

THE TREATMENT OF TONSILLITIS WITH SMALL DOSES OF SULFONAMIDES

CAPTAIN EDWARD D. FREIS

MEDICAL CORPS, ARMY OF THE UNITED STATES

From both military and economic aspects, any relatively nontoxic therapy which will shorten the course of a prevalent disease, if even for a few days, is worthy of application. Since it is generally acknowledged that tonsillitis is responsible for a significant number of the total man hours lost to industry and the armed forces, the advisability of treating acute follicular tonsillitis with sulfonamides has been the subject of a variety of studies. From the medical point of view, chemotherapy would be desirable because of the possibility that such complications as peritonsillar abscess and such sequelae of tonsillitis as nephritis and rheumatic fever might be prevented or at least minimized.

The advisability of using large doses of sulfonamides (2 Gm. or more per day) in the treatment of tonsillitis remains controversial. Some believe that, since this disease is relatively benign and self limited, chemotherapy is unnecessary and even dangerous.¹ This view is supported by the number of serious toxic reactions that have resulted from the indiscriminate use of the sulfonamides. Others believe with Gettelman and Kaiz² that early treatment with sulfonamides (2 Gm. per day) appreciably shortens the course of the disease.

From the AAF Rheumatic Fever and Streptococcal Disease Control Program.

Lieut. Col Robert King, M. C., and Dr. Chester S. Keefer cooperated with suggestions and criticisms.

From the Medical and Laboratory Services, AAF Regional Station Hospital, U. S. Army Air Field, Lincoln, Neb.

1. Rhoads, P. S., and Afremov, M. I. Sulfanilamide in the Treatment of Sore Throat Due to Hemolytic Streptococci, with Controls, *J. A. M. A.* 114: 942 (March 16) 1940. Richards, L. G.: Treatment of Diseases of the Throat, *ibid.* 115: 501 (Aug. 17) 1940. Hughes, L. W.: Diseases of the Nasopharynx, *Mississippi Doctor* 18: 261 (Oct.) 1940. Kernan, J. D.: Infections of the Mouth, Pharynx, and Respiratory Tract, *Bull. New York Acad. Med.* 17: 674 (Sept.) 1941. Beckman, H.: Treatment in General Practice, ed. 4, Philadelphia, W. B. Saunders Company, 1942.

2. Gettelman, E., and Kaiz, S. P.: The Treatment of Severe Tonsillitis in a Naval Dispensary, *U. S. Nav. M. Bull.* 42: 199 (Feb.) 1944.

A middle of the road point of view is taken by Janeway,³ who prescribes chemotherapy only for those patients whose temperature exceeds 102 F.

In addition to systemic therapy, the local treatment with sulfonamide sprays has become popular. Many investigators have reported effective therapeutic results and an absence of drug reactions following the use of local sprays in the treatment of various upper respiratory infections.⁴

In order to establish the relative efficacy of the local and systemic administration of sulfonamides in the treatment of acute follicular tonsillitis we considered it necessary to study this question under controlled conditions using hospitalized patients.

METHOD

During the winters of 1943 and 1944 a series of 405 young men of military age who had definite clinical evidence of acute follicular tonsillitis were hospitalized to a separate ward devoted to their care. During the first year of the study the patients were divided into two groups, alternate patients being treated by one of two methods. One group (1) of 100 patients were given only hot saline irrigations every four hours and received no chemotherapy. The other group (2) of 100 patients were treated with hot saline irrigations every four hours and in addition received sulfanilamide spray to the tonsils and pharynx every two hours except while asleep. Powdered sulfanilamide was sprayed into the throat until an even white coating of the mucous membranes was produced, the patient being then instructed to swallow, following which the throat was again sprayed.⁵ The amount of sulfanilamide used per dose varied from 75 to 100 mg. and, as eight applications were administered daily, the total daily dosage varied from 500 to 800 mg. With this dosage blood sulfanilamide levels were never found to be above 1 mg. per hundred cubic centimeters and usually were too low to be read by standard methods.

During the second year group 3, consisting of 115 patients, received saline irrigations every four hours and, in addition, 125 mg. of sulfadiazine by mouth four times a day (500 mg. daily). The sulfadiazine was in tablet form and was swallowed immediately. Another group (4) of 90 cases was treated in the same way as group 2 except that "microform crystals" of sulfadiazine⁶ were substituted for sulfanilamide powder.

On admission a throat culture and white blood count were obtained. Patients who showed peritonsillar abscess, fusospirochetal ulcers of the tonsil, scarlet fever, acute glomerulonephritis or rheumatic fever on admission were not included in this study. Similarly excluded were patients who had the common cold with nasopharyngitis and tonsillar swelling without pronounced redness or follicles.

As indicated in the table, the four groups were essentially similar in regard to admission temperature, infecting organism and average admission leukocyte counts.

3. Janeway, C. A.: Medical Progress. The Sulfonamides, *New England J. Med.* 227: 1029 (Dec. 31) 1942.

4. Freeman, M. S.: Local Use of Sulfathiazole Powder for Acute Pharyngeal Infections, *Arch. Otolaryng.* 37: 196 (April) 1943. Silcox, L. E., and Schenck, H. P.: Use in Otolaryngology of Microcrystals of Drugs of the Sulfanilamide Group *ibid.* 36: 171 (Aug.) 1942. Dolowitz, D. A.; Loch, W. E.; Haines, H. L.; Ward, A. T., and Piel, K. L.: The Prevention of Ear and Nasal Sinus Complications of the Common Cold, *J. A. M. A.* 123: 534 (Oct. 30) 1943. Turnbull, F. M., Hamilton, W. I., Simon, E., and George, M. F.: Sinusitis and Infections Secondary to the Common Cold, *ibid.* 123: 536 (Oct. 30) 1943.

5. The DeVillars standard atomizer type powder blower No. 175 was used.

6. Smith, Kline and French laboratories supplied the sulfadiazine microform crystals.

RESULTS

The groups which received sulfonamides (2, 3 and 4) either locally or systemically showed a return to normal temperature and "clinical recovery" in an appreciably shorter period of time than the control group (1) treated with irrigations alone (as shown in the table). Statistical examination of our data reveals that a reliable difference exists between group 1 and the other (sulfonamide treated) groups, since the reliability of the differences of the control group as compared with each of the sulfonamide treated groups is greater than three.

The criteria for "clinical recovery" were complete subjective relief of symptoms and complete disappearance of erythema, edema and follicles. Many of the patients, particularly in the sulfonamide treated groups, were subjectively well before the signs of inflammation had completely subsided. Hence it is probable that in other hands this period of "to clinical recovery" might be shorter or longer. Obviously this interim has not the same objectivity as "return to normal temperature" and therefore is not equally significant.

4 and group 2 can be attributed to the well known fact that sulfadiazine is more effective in infections caused by the hemolytic streptococcus than is sulfanilamide.

The fact that the patients in group 3, who received 0.5 Gm. of sulfadiazine daily in tablet form, showed a rate of recovery comparable to the groups receiving local spray raises the question of the advisability of using topical therapy in the treatment of tonsillitis. As tablets are more easily administered than local spray, there is no clinical reason for the use of the latter in the treatment of this condition.

The saving of even one day in hospitalization has much economic and military importance, since, when the incidence of tonsillitis is considered, this saving can be translated into terms of thousands of man-days salvaged. In view of the fact that the patients receiving sulfonamides experienced subjective relief even though some residual signs of subsiding inflammation remained, it is possible that such patients can be discharged to military duty or to industry as soon as the temperature becomes normal, with the stipulation that they con-

Summary of Data

Groups	No. of Cases	Temperature on Admission	White Blood Cells on Admission, Thousands	Positive Hemolytic Streptococcus	Days to Normal Temperature				Days to Clinical Recovery				Complicating Peritonsillar Abscess
					Mean	S. D.	S. E. M.	Reliability of Difference	Mean	S. D.	S. E. M.	Reliability of Difference	
1	100	101.6 (98.8-104.2)	13.7 (5-24)	83	3.3	1.68	0.168	...	4.7	1.95	0.195	...	6
2	100	101.7 (98.6-104.6)	13.6 (5-23)	85	2.3	1.07	0.107	5.0	3.5	1.44	0.144	5.0	1
3	115	101.7 (99.2-104.8)	12.5 (5-23)	86	1.6	0.88	0.082	9.1	3.6	1.24	0.116	4.9	1
4	90	101.4 (98.6-104.5)	12.6 (5-26)	78	1.4	0.73	0.077	10.2	3.0	1.15	0.121	7.4	0

$$S. D. (\text{standard deviation}) = \sqrt{\frac{\sum d^2}{n}}$$

$$S. E. M. (\text{standard error of mean}) = S. D. / \sqrt{n}$$

$$\text{Reliability of difference} = \frac{\text{Difference between means}}{\sqrt{(S. E. M._1)^2 + (S. E. M._2)^2}} \quad (\text{all comparisons made between group 1 and the other groups}).$$

The control group (1) showed an incidence of 6 cases of peritonsillar abscess, which developed as a complication during the period of hospitalization. In both the sulfanilamide spray treated group (2) and in the group receiving sulfadiazine tablets (3) one complicating peritonsillar abscess developed, while none occurred in the group receiving microform crystals of sulfadiazine as a local spray.

The data reveal that the temperature returned to normal more rapidly in the sulfadiazine-treated groups (3 and 4) than in the sulfanilamide spray treated group (2). The group receiving sulfadiazine microform crystals locally (4) seemed to be the most benefited. However, the differences between the various sulfonamide treated groups are not of sufficient significance to merit separate discussion.

None of the patients who received sulfonamides developed either toxic reactions or evidences of sensitization.

COMMENT

Our data demonstrate that small, nontoxic doses of sulfonamides will appreciably reduce the period of illness associated with tonsillitis, irrespective of the route of administration of the drug. That the difference between the sulfonamide treated groups and the control group is real is indicated by statistical examination of the data. The small difference between groups 3 and

4 and group 2 can be attributed to the well known fact that sulfadiazine is more effective in infections caused by the hemolytic streptococcus than is sulfanilamide.

It is possible that the use of more than 500 mg. of sulfadiazine daily would have further hastened recovery. However, when dealing with a potentially harmful drug, a balance must be struck between effective and toxic dosage. The complete absence of sulfonamide reactions in the treated groups favors the use of small dosage in the treatment of tonsillitis. This does not imply that these small doses of sulfonamides necessarily are effective in other infections.

CONCLUSIONS

1. The administration of small doses of sulfonamides appreciably shortens the course of acute follicular tonsillitis and minimizes the complication of peritonsillar abscess.

2. Small doses (500 mg. per day) of sulfadiazine administered by mouth in tablet form are as effective as the local application of sulfonamides to the tonsillar area in the form of a powder spray. The ease of administration makes the systemic route the ideal therapeutic procedure.

3. There were no toxic or sensitization reactions observed in any of the 305 patients receiving sulfonamides in the doses given.

Clinical Notes, Suggestions and New Instruments

HEMOGLOBIN ESTIMATION BY THE REVOLUTIONARY COLORIMETRIC METHOD OF KENNEDY

WITH FURTHER REPORT ON A SIMPLE INSTRUMENT FOR FACILITATING THE UTILIZATION OF THE PRINCIPLE

DON H. DUFFIE, M.D., CENTRAL LAKE, MICH.

In 1926 Robert P. Kennedy¹ published a method of colorimetry, for hemoglobin especially, that was so new, so valuable, that it is indeed regrettable that the very scholarliness of his paper seems to have concealed his discovery from most of us.

With the exception of spectrophotometry, practically all previous colorimetry had comprised sundry expedients for the matching of colors. In Kennedy's hemoglobin method, by means of a light filter transmitting such a narrow band of wavelengths in the green as to be virtually monochromatic, he simply eliminated color from both standard and unknown, then matched light intensities instead—a totally different concept.² He could do this—and this is the whole point—because, as seen through his filter, red and gray both appear green. Not merely green, but when illuminated to equal brightness both appear of the identical hue of green.

I have stated before³ the basic principle as applied to hemoglobin, that green light is absorbed by a red solution. The more red substance present, the less green light will get through, so that by suitably measuring how much does get through the amount of the red substance (oxyhemoglobin) may be computed.

As Kennedy points out, color filters had been employed in colorimetry as far back as Leonardo da Vinci in the sixteenth century, but to the best of my knowledge always either as a means of facilitating color matching or else in the absurd quest of finding an exact additive color complement for each and any color, so that the combination might then be compared in intensity with white light.

The bold idea of cutting loose from color entirely, of doing with our own eyes exactly what the photoelectric colorimeter does—quantitative measurement of colored light—that, so it is believed, was new with Kennedy. In spite of his superb work, however, said photoelectrics have right to date enjoyed virtual if quite unwarranted monopoly of the principle. Kennedy's hemoglobin method does sound cumbersome: indeed it was never propounded as a clinical method, though it may readily be adapted as such very satisfactorily.⁴

Unaware of Kennedy's work until it was brought to my attention by another⁵ who found himself inadvertently trespassing on Kennedy's domain, I, a country doctor and reformed color process photoengraver, had arrived at the same idea empirically, thanks to years of familiarity with light filters in

the trade. Kennedy used an ordinary colorimeter, a number 74 filter, one cup replaced by a fixed gray standard, the solution depth in the other cup varied as needed to secure a luminosity match with the gray standard. I applied the principle in reverse, keeping the solution layer constant and securing a match by varying the gray, in the form of an optical wedge. This application lends itself to a less elaborate instrument, a less expensive one, and one considerably quicker to use. The scale, for direct reading through the eyepiece, is superimposed on the margin of the wedge. This instrument that I have devised is a plungerless, one cup colorimeter (more correctly, photometer) using a micrometer measured Kahn vial for solution cup and having my own green filter incorporated in the eyepiece. One time saving feature of this construction when used for hemoglobin is that, while a precise 20 cu. mm. of blood must be used, the volume of diluent need not be measured at all. This is because light reaching the eye vertically through the solution will have encountered a constant quantity of blood per unit area, be the depth little or much. (It is ever a disappointment when any one fails to argue this point!) The test can readily be done in less than one minute.

CALIBRATION

Aware of having neither ability nor facilities for the quest of the absolute in hemoglobin values, I am content, in calibrating my instrument, to strike a compromise among the weird chaos of calibration levels of instruments already on the market, in which discrepancies of more than 3 grams are found! Since in this type of instrument there are economic and other objections to continuing the wedge down to zero, mine has been arbitrarily restricted to the range between 5 and 20 Gm. of hemoglobin. For zero set, readings are made from a sheet of permanent gray standard, and, in event of the gray not giving a

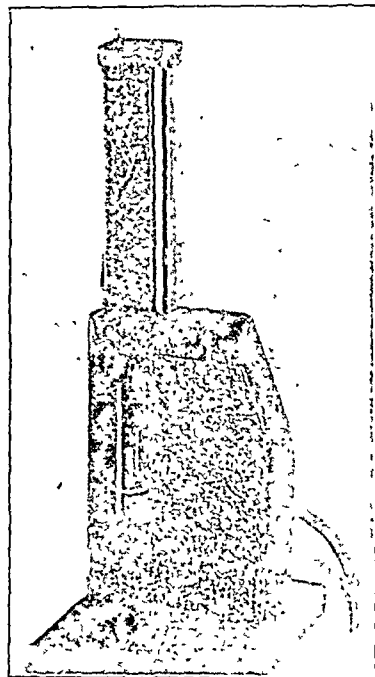


Fig. 1.—Simple photometer employing Kennedy's principle. Fields are matched by manipulation of an optical wedge moving in the sleeve at right of ocular. Scale is read through the eyepiece.

match at the supposed value, the lamp of the instrument is adjusted in position until it does. One advantage of such an arrangement is that it gives free rein to individual convictions in the matter of calibration levels, which may be "remodeled to suit tenant" in a moment. The critic need but set the instrument scale to read whatever his own oracle decrees the blood in question should read and then adjust the lamp position, if need be, until it does. The gray standard is then read at the new setting and labeled accordingly. Stability is thus assured until another Pharaoh arises! This permanent gray standard may be either an Eastman neutral density filter in glass, density 1.0, two layers of fine monel or other screen in glass as suggested by Sunderman,⁵ or my present preference, a small square of engraver's halftone screen.

ACCURACY

Karr and Clark,⁶ in hundreds of determinations by several of the commoner hemoglobin methods, after applying all corrections found fewer than one half of the readings to be within

The instrument is not in commercial production "for the duration." A few of the instruments are being built in the author's hobby shop.

1. Kennedy, R. P.: The Use of Light Filters in Colorimetry, with a Method for the Estimation of Hemoglobin, *Am. J. Physiol.* 78: 56 (Sept.) 1926.

2. Should any suspect this to be distinction without difference, let him ponder the unequal scale divisions, so much farther apart in the lower concentrations, of any hemoglobin instrument employing the wedge principle on a color matching basis. Contrast this with the scale divisions in equal parts throughout, where the wedge is used on the Kennedy principle, as in my own photometer.

3. Duffie, D. H.: The Elimination of Color from Visual Hemoglobinometry, *J. A. M. A.* 119: 493 (June 6) 1942.

4. But meager outline may be given here. A colorimeter cup not more than 12 mm. in diameter is preferable. A piece of Eastman neutral density filter of density 0.5 mounted in glass replaces one colorimeter cup. If brilliant illumination is available, Wratten number 74 filter is laid over the eyepiece, if not, one layer of number 15 and two layers of number 60 film filter. (For some eyes one layer of 60 is enough to exclude all red.) In the remaining colorimeter cup 0.02 cc. of blood (Sahli pipet) in 5 cc. of 0.4 per cent ammonium hydroxide solution is placed and the fields are matched. My own experience with such an instrument is too scanty for dogmatism, but by trial with known blood dilutions a factor may be worked out which, divided by plunger height (decimal point appropriately inserted) will give the hemoglobin in grams per hundred cubic centimeters. The factor 1.7 is believed to be not greatly in error. Once a table or curve for direct reading of results is prepared, the method is rapid.

5. Sunderman, F. W.: Personal communication to the author.

6. Karr, W. G., and Clark, J. H.: Comparison of Various Hemoglobin Methods as Performed in Hospital and Physicians' Laboratories *Am. J. Clin. Path. (Tech. Supp.)* 5: 127 (Sept.) 1941.

0.5 Gm. (3 per cent) of the mean. In a test later reported by one of them⁷ on my instrument, in which two of the three observers had had no practice, 95 per cent of the sixty readings were within 0.25 Gm. of the mean (1.5 per cent). This is indeed a precision often unattained by the photoelectrics.

The secret of this higher precision is believed to lie in the filter employed. The retina evidently has heightened sensitivity to minute differences in intensity for wavelengths transmitted by this filter when shielded from the "glare" of waves excluded by the filter's absorption

BLOOD CHEMISTRY

Not knowing (fortunately) that maximum filter transmission theoretically should be restricted to a wavelength range coinciding with the maximum absorption of the solution to be tested, so that a different colored filter would be required for nearly every color of solution measured, I went ahead, using my same green filter for all the blood chemistry filtrates I could find. Before learning from wiser heads that this could not be done, I had done it. Entirely satisfactory readings were obtained, which plotted as almost straight lines, from

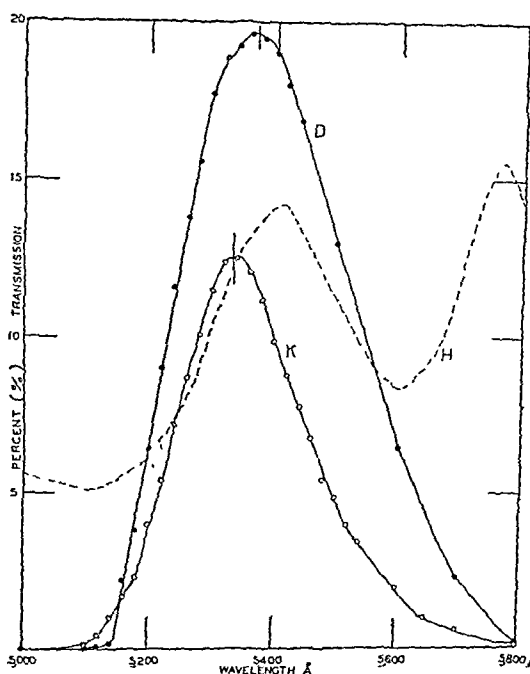


Fig 2—Transmission curves of Kennedy's filter (K), Duffie (D), shown against the absorption curve of oxyhemoglobin.

blood sugar, creatinine, urea, phosphorus, tyrosine, total protein, Haslam's⁸ unpublished serum protein method, nonprotein nitrogen and all modifications tried of the Bratton-Marshall sulfa-concentration method. The case with creatinine is interesting. The filtrate itself gives perfectly sharp readings, whereas the bichromate standards, indistinguishable to the eye from the respective filtrates, give no readings whatever with this filter. It was to me surprising that the greens of the blood cholesterol test can also be closely read through the green filter, though they plot a sharply inflected curve. While it is true that with one or two of these solutions this filter does not give an absolute hue match, even so, the only blood chemistry test I have found on which it will not give satisfactory readings is the yellow of the sulfonamide concentration test with Ehrlich's reagent. The saving of the technician's time is obvious if standard solutions need be run but once for calibration then occasionally as check on reagents.

7. Karr, W. G.: Personal communication to the author in October 1942.

8. Haslam, T. P.: Personal communication to the author. (According to Haslam's equation, if for blood sugar precisely 3 cc. of the filtrate is used in my instrument, a cipher added to the gram scale reading gives the sugar in milligrams per hundred cubic centimeters.)

CALIBRATION FOR OTHER TESTS

Once a set of four or five standard solutions have been processed, in strengths covering the usual clinical range of the test, calibration is almost quicker done than fully described. Briefly, readings are obtained in the instrument from suitable and precisely equal volumes of these standard solutions, plotted on graph paper against the known concentrations of these solutions, and a standard curve drawn. Values of identical volumes of unknown solutions may then be instantly evaluated in terms of concentration, from the curve. Having done which, one may be reasonably sure of his results and need take no man's word for anything.

SULFONAMIDE CONCENTRATION TESTS

Readings of sulfonamide drug concentration tests by any method using Marshall's reagent may be done so accurately on this instrument, with the same filter and from such small amounts of blood, that truly micro volumes may be used, 0.02 cc. of blood instead of 0.2-0.3 cc., as in several micro methods.

TWO CASES OF CLOSTRIDIUM WELCHII INFECTION TREATED WITH PENICILLIN

MAYNELL KEPL, MD, ALTON OCHSNER, MD, AND
J. LEONARD DIXON, MD, NEW ORLEANS

We believe that the development of gas gangrene in a traumatic wound depends on four factors: (1) contamination of the wound with soil or foreign bodies containing clostridia, (2) inadequate blood supply to the affected part, (3) inadequate débridement and (4) conditions in the wound for anaerobic growth. A combination of these four factors in a given patient will almost invariably give rise to clinical "gas gangrene."

Once clinical "gas gangrene" has fully developed, the only known treatment is radical surgery, laying the affected parts wide open and many times, of necessity, doing a high guillotine amputation in order to save the patient's life.

Any chemical or biotic substance which will inhibit the growth of clostridia in traumatic wounds would be of inestimable value in saving limbs and lives.

The discovery by Fleming¹ of the action of penicillin and its use by McIntosh and Selbie² in experimental *Clostridium welchii* infections held promise that this drug would be of value in such infections. As animal experiments are inconclusive in regard to human therapy, it remains for the clinician to put penicillin to the final test in regard to its efficacy in the treatment of gas gangrene. The recent report of Keefer, Blake, Marshall, Lockwood and Wood³ indicates that more clinical observation on the action of penicillin in "gas gangrene" infection is needed in human cases before definite conclusions can be drawn. Lyons⁴ also makes a similar plea.

McKnight, Loewenberg and Wright⁵ have reported their experience in a case of "gas gangrene." They could not control the "gas gangrene" infection with wide incisions, sulfathiazole systemically, large doses of gas antitoxin and high voltage x-ray therapy. A high arm amputation was resorted to, but

Leah Seidman Shaffer, ScD, made the bacteriologic studies
From the Department of Surgery, School of Medicine, Tulane University

Dr. Kepl is fellow in orthopedic surgery, Division of Medical Sciences, National Research Council.

The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Tulane University of Louisiana.

1. Fleming, A.: An Antibacterial Action of Cultures of Penicillin with Special Reference to Their Use in Isolation of *B. Influenzae*, *Brit J Exper. Path* 10:226 (June) 1929

2. McIntosh, J., and Selbie, F. R.: Zinc Peroxide, Proflavine and Penicillin in Experimental *Clostridium welchii* Infections, *Lancet* 2:750 (Dec 26) 1942.

3. Keefer, C. S.; Blake, F. G.; Marshall, E. K., Jr.; Lockwood, J. S., and Wood, W. B., Jr.: Penicillin in Treatment of Infections, *J. A. M. A.* 122:1217 (Aug. 28) 1943.

4. Lyons, C.: Penicillin in Surgical Infections in the United States Army, *J. A. M. A.* 123:1007 (Dec. 18) 1943.

5. McKnight, W. B.; Loewenberg, R. D., and Wright, V. L.: Penicillin in Gas Gangrene, *J. A. M. A.* 124:360 (Feb. 5) 1944.

gas bubbles persisted in the axillary wound. Intravenous sodium penicillin in isotonic solution of sodium chloride was given continuously on the second postoperative day until the edematous condition of the patient made it necessary to stop therapy. In addition, the patient received 40,000 units directly intramuscularly into the stump. During the next week the temperature gradually dropped, and the wound cleaned up. No positive bacteriologic identification of the causative organism was done, owing to inadequate laboratory facilities. It was agreed by four experienced clinicians, however, that the case was one of clinical "gas gangrene."

Recently we have had occasion to study two cases of *Clostridium welchi* infection, both of which were treated with penicillin. In one, following a shotgun injury to the lateral aspect of the thigh, there was no evidence of clinical "gas gangrene," but a persistent *Cl. welchi* cellulitis associated with *Staphylococcus aurantiacus*, coagulase positive, and a gram negative anaerobic bacillus, unidentified as yet. Calcium penicillin was applied directly to the wound in a dilution of 5 cc. of isotonic solution of sodium chloride containing 20,000 units. Local administration of this dosage was continued for six days. Cultures were taken before, during and after penicillin therapy. Under local penicillin therapy the number of gram negative organisms and *Staphylococcus aurantiacus* appeared reduced in direct smear preparation with an increase in the number of



Fig 1—Arm and forearm, edematous, "wet" and ischemic before penicillin and surgery. Note the multiple bullae.

cocci phagocytized. The clostridia found lacked a good capsule but persisted undiminished in the wound throughout penicillin therapy. A milk tube inoculated with a swab consistently showed "stormy" fermentation. The wound healed slowly by granulation over a period of seven weeks, and at no time was the patient's general condition impaired by the *Cl. welchi* cellulitis.

The second case was that of a man whose arm was lacerated by broken glass which severed the biceps, the brachialis, the radiobrachialis muscles, the brachial artery, the radial and median nerves and the median basilic vein. Bleeding was severe, and a tight tourniquet was put on before he entered the hospital. Complete débridement and closure were done early, followed by repeated stellate blocks and packing of the injured extremity in ice. The temperature, 100 F. on admission, went to 102 F. the next day. The fingertips were inspected at that time and found warm and pink. The patient began to complain of severe pain in the arm. On the third day the arm was swollen and painful to the touch. Dressing on the fourth day revealed crepitation along the radial side of the forearm, with bubbles of gas escaping from the suture line. There was bronzing of the tissues around the elbow and a putrefactive odor to the arm. Multiple bullae were present on the skin of the forearm. The fingertips were cold and pale (fig. 1). The patient was toxic and in great pain, with a temperature of 103 F.

All sutures were removed, smears of exudate made and a blood culture was taken. *Cl. welchi* and beta-hemolytic streptococci were identified from the wound, and blood culture was positive for beta-hemolytic streptococci. Sulfadiazine was immediately

given by mouth, 70,000 units of "gas gangrene antitoxin" given intramuscularly, hot wet dressings applied locally, and a transfusion of 500 cc. of citrated blood administered. The next morning the temperature had dropped a little, he appeared less toxic, and his blood culture had become negative. His arm had definitely become worse, however, and the edema appeared to have spread to the axilla, while crepitation could be noticed in the upper arm and shoulder. One hundred thousand units of sodium



Fig 2—Appearance of stump the day after surgery and penicillin. The gloved finger is placed in the lateral skin flap. The exposed biceps muscle is viable.

penicillin was given in 100 cc. of isotonic solution of sodium chloride intravenously, 500 cc. of citrated blood was given and a guillotine amputation was done under cyclopropane anesthesia. At operation, the skin and fascia of the stump were split longitudinally and left open. Swabs taken from this area at operation showed gram positive bacilli and gram positive cocci, which on culture proved to be *Cl. welchi* and beta-hemolytic streptococci. Powdered calcium penicillin, 100,000 units, was sprinkled dry into the stump, Dakin tubes were inserted, the stump was bandaged and sealed with cellophane, and a continuous local drip of 1,000 cc. of isotonic solution of sodium chloride containing 100,000 units of calcium penicillin started.

The next morning the wound was dressed. The exposed muscle was clean. A culture taken from the wound showed only a scant growth of diphtheroid organisms. No *Cl. welchi* or beta-hemolytic streptococci were found (fig. 2) on smear or culture.

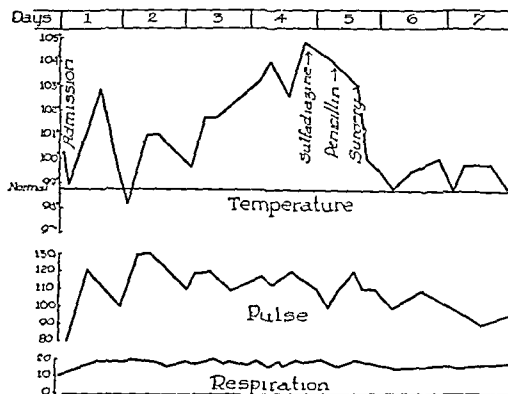


Fig 3—Temperature, pulse and respiration during the first week in the hospital. Notice the sharp drop in temperature and pulse rate following penicillin and amputation.

The clinical course postoperatively was uneventful except that a thrombophlebitis developed at the site of the intravenous penicillin therapy. The stump now has a pyocyanus infection from ward contamination, but healing is assured. The patient still has a low fever, 99 F., but the stump is ready for skin grafting. Figure 3 shows the temperature, pulse and respiration curves during the first week in the hospital.

SUMMARY

Of 2 cases of *Cl. welchi* infection, 1 was treated locally with calcium penicillin and the other systemically with sodium penicillin and locally with calcium penicillin. Careful bacteriologic studies showed persistence of *Cl. welchi* in the case of cellulitis treated with calcium penicillin locally, while the use of penicillin systemically and locally, combined with guillotine amputation, caused the disappearance of beta-hemolytic streptococcus and *Cl. welchi* from the spreading infection. After oral sulfadiazine, beta-hemolytic streptococci could not be recovered from the blood stream. It must be emphasized that good surgery was the deciding factor in the second case and that penicillin is of most benefit when used in conjunction with good surgical principles.

A PRIMIPARA WITH DIABETES AND MILD TOXEMIA
TREATED SUCCESSFULLY WITH DIETHYL-
STILBESTROL

BYRON D. BOWEN, M.D., BUFFALO

The wide experience of Priscilla White¹ in the study of the chorionic gonadotropic hormones and the effect of the use of the estrogens and progesterone in the treatment of pregnant diabetic patients, on whom an increase of these hormones was found, is more than suggestive that their use reduces the incidence of, and is effective in, the treatment of preeclamptic toxemia of pregnancy and thereby reduces the fetal and maternal mortality.

The nature of this action is not understood, nor is the metabolism of the estrogens. It may be that the estrogenic substances have a "salutary" effect on the liver. It has been demonstrated that pregnant women can tolerate large amounts of estrogens. Among the possibilities of this beneficial effect are the inhibition of the diabetogenic hormones of the pituitary, the reduction of the rate of glycogenolysis or the removal of antagonistic insulin action, as White's cases have shown that insulin could usually be reduced after the administration of the estrogen. The following case demonstrates this relationship to a high degree:

REPORT OF CASE

History.—Mrs. E. F., aged 23, admitted to the diabetic service of the Buffalo General Hospital Oct. 7, 1943 and discharged Jan. 9, 1944, was referred by Dr. Raymond May, Alden, N. Y. The diabetes was discovered in 1932; she had taken insulin since that time. Because of considerable variation in weight and insulin dosage it was suspected that the control of the diabetes had not been accurate much of this time. She had been in various hospitals on several occasions for adjustment of the diabetic regimen. One of these admissions, at the age of 15, was because of diabetic coma. She had had an enlargement of the thyroid gland since the age of 10. At the time of admission the insulin dose was 90 units of the protamine zinc and 10 to 20 units of the unmodified before breakfast. Her last menstrual period was March 17, 1943. Since the onset of the pregnancy she had experienced some loss of appetite, headache and periods of weakness. For several weeks before admission she had rather frequent attacks of what she thought were insulin reactions—palpitation, sweating, shortness of breath and a choking sensation.

Physical examination showed the following positive findings: diffuse but slight enlargement of the entire thyroid gland; slight accentuation of the basal heart sounds, especially on the aortic side; blood pressure 118 systolic, 82 diastolic; pulse rate 120 to 130; seven months' pregnancy. She was on the whole cheerful, but there appeared to be quite violent mood swings, when she became quite depressed.

Course.—Shortly after admission she began to have attacks of "insulin reactions"; blood sugar determinations made during these attacks were always elevated, and orange juice failed to relieve them quickly. These "spells" were always associated with tachycardia, and during one attack her pulse rate rose to 180. Two electrocardiograms taken two and five days after admission showed a normal sinus rhythm with a rate of 116

and 138 respectively, negative T_s and a tendency to right axis deviation. It then came to our attention, from the Social Service Department, that her husband, who had been in the army forces, was missing several months. It seemed probable that these alleged "insulin reactions" were, in all probability, anxiety attacks. She was seen in consultation by Dr. Mabel Ross from the Psychiatric Department, who concurred in the nature of the attacks. However, Dr. Ross believed that the patient's failure to accept the diabetes and her inability to live as other people did was also a contributing factor. No further attack occurred after their nature was carefully explained to the patient and she had been assured that she would get along all right. On October 15, one week after admission, slight pretibial edema was first noted. There was no essential change in the blood pressure. The urine continued to be free of albumin and abnormal elements in the sediment.

On November 1 she had her first attack of diarrhea. These attacks continued several times each week—often as many as eight watery evacuations daily. These disappeared with the other evidences of toxemia. Several stools showed no occult blood. Culture of the feces was negative for pathogenic enteric organisms.

On November 23 the first trace of albumin in the urine was reported. This persisted and reached a 2 plus reaction by December 8.

On November 4 her blood pressure, which had been measured twice daily, showed its first conspicuous rise: 144 systolic, 84 diastolic; it continued to be essentially in that zone save for an occasional normal or rare higher reading until the toxemia improved.

On admission her red blood cells numbered 4,100,000, with 13.5 Gm. of hemoglobin per hundred cubic centimeters of blood. The white cells numbered 11,000, with 8 per cent bands, 56 filaments, 2 eosinophils, 30 lymphocytes and 4 monocytes. A slight anemia was first noted on November 18, when the red cells dropped to 3,500,000, with 9 Gm. of hemoglobin per hundred cubic centimeters. The leukocytes dropped to 7,900 per cubic millimeter, with no essential change in the differential. On November 26 the red blood cells numbered 3,660,000, with 11 Gm. of hemoglobin.

Two of our enterprising and interested clinical clerks, Mr. Melvin N. Wood and Mr. Paul J. Wolfgruber, determined the serum chorionic gonadotropic hormones on November 11. They were found to be at least 500 rat units per hundred cubic centimeters of blood. This was repeated again on November 26. Then one rat, which had a dose of serum corresponding to 1,700 rat units per hundred cubic centimeters, showed a corpus luteum, but the other rat, which received an amount corresponding to 1,000 rat units per hundred cubic centimeters of blood, showed no corpora lutea macroscopically. Just before her delivery an attempt was made to estimate the blood serum chorionic gonadotropic hormones. Unfortunately this was indeterminate.

On December 1 the patient was given diethylstilbestrol 2 mg. three times a day in the hope that it would alleviate the toxemia. Her weight, which had steadily increased from 58 Kg. (127½ pounds) on admission, had by this time reached 67 Kg. (147½ pounds). Coincident with the use of the diethylstilbestrol there was a prompt and gradual loss of weight with conspicuous diuresis, so that the weight was reduced to 62 Kg. (137 pounds) by the time of delivery on December 17. Also the systolic blood pressures were definitely lower, but the diastolic remained in the neighborhood of 90.

From the beginning the diabetes was difficult to manage. Except for the first two weeks, when the carbohydrate content in her diet was changed back and forth several times from 180 Gm. of carbohydrate to 140 Gm., her diet remained constant all through the observations at 160 Gm. of carbohydrate, 80 Gm. of protein and 110 Gm. of fat. A combination of protamine zinc insulin 90 units and unmodified insulin 30 units resulted in continuous glycosuria up to as high as 50 Gm. daily. An equal number of units of the unmodified insulin given in three doses—morning, evening and midnight—gave somewhat better control, but as the toxemia became more apparent this had to be increased gradually until the patient was receiving 90 units before breakfast, 68 before supper and 68 at midnight on December 1, when the diethylstilbestrol was started. The fast-

From the Buffalo General Hospital and the University of Buffalo School of Medicine.

1. White, P., and Hunt, H.: Pregnancy Complicating Diabetes: A Report of Clinical Results, *J. Clin. Endocrinol.* 3: 500 (Sept.) 1943.

ing blood sugar on November 29 was 250 mg. per hundred cubic centimeters. Promptly after the administration of diethylstilbestrol, hypoglycemic reactions, which had not been present before, followed—fifteen in eleven days; in three of these, concentrated dextrose solution had to be given intravenously. This occurred in spite of the sharp reduction of the insulin dosage. The reactions did not cease until the dose had been lowered to 44 units in the morning, 30 units before supper and 10 units at midnight. It is interesting that there were but a few grams of dextrose in the urine even after the administration of 50 cc. of 50 per cent dextrose intravenously.

She was delivered on December 17 by Dr. Clyde Randall. Both her labor and her delivery were uneventful. She had an episiotomy. Caudal and chloroform anesthesia were used. Her blood pressure taken during labor was 120 systolic, 80 diastolic on one occasion and 128 systolic, 90 diastolic on another. The weight of the male fetus was 7 pounds 7 ounces (3,570 Gm.).

She required only slightly less insulin after delivery than she had previously: 36 units before breakfast, 16 before supper and 10 units at midnight.

She was discharged on a regimen of 180 Gm. of carbohydrate, 90 Gm. of protein and 120 Gm. of fat with 90 units of protamine zinc insulin and 16 of the unmodified insulin before breakfast. There was slight glycosuria occasionally during the day. Her fasting blood sugar was 182 mg. per hundred cubic centimeters. She had no insulin reactions.

SUMMARY

A primipara who was severely diabetic and who had had diabetes for twelve years was studied in the hospital for a period of three months.

The development of mild toxemia of pregnancy was observed—edema, albuminuria, diarrhea, mild hypertension and anemia. During this period the insulin requirement was nearly doubled. The chorionic gonadotropic hormones exceeded 500 rat units per hundred cubic centimeters of blood.

Soon after the oral administration of diethylstilbestrol 6 mg. daily the symptoms and signs of the toxemia disappeared, and the insulin dosage had to be promptly reduced because of the occurrence of many insulin reactions. At that time an estimation of the chorionic gonadotropic hormone was, unfortunately, indeterminate.

100 High Street.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following reports.

HOWARD A. CARTER, Secretary.

KREISELMAN RESUSCITATOR BELLOWS TYPE, MODEL 110, ACCEPTABLE

Manufacturer: The Ohio Chemical & Manufacturing Co., 1177 Marquette Street, Cleveland.

The Kreiselman resuscitator is designed to administer artificial respiration to all except the newborn. In general the apparatus as marketed consists of a bellows having an air and oxygen intake valves, an exhaust and a relief valve, a handle, an elbow connector for the face mask, an airway and a carrying case.

OPERATION

Administration of the air or air-oxygen mixture is accomplished by applying the mask over the patient's nose and mouth in airtight fashion and manually expanding and compressing the bellows. With the patient in the prone position, the head is turned slightly resting on the patient's hand as when using the prone pressure method of manual artificial respiration. When the patient is in the prone position the resuscitator is used with an elbow interposed between the exhaust valve of the bellows and the mask.

The oxygen intake valve has an inlet nipple to which a supply tubing for oxygen is attached. The valve is large enough to admit sufficient oxygen under pressure for therapeutic purposes. When the resuscitator is used with air only, this valve remains closed. The relief valve on the bellows operates at an internal

pressure of 14 to 15 mm. of mercury and discharges freely the contents of the bellows at a pressure of 25 mm. of mercury.

The technic of operation is as follows:

1. Clear the mouth and throat of mucus and remove any foreign bodies from the mouth. Use a clean handkerchief or cloth if an aspirator is not available.
2. Place patient on back with hand extended, then carefully insert tip of airway above tongue along roof of mouth until the airway is well behind tongue thus holding it forward.
3. Keep chin raised.
4. Place mask over nose and mouth and hold it on airtight with one hand.
5. Operate bellows with other hand as follows:
 - (a) Place the hand palm down under strap handle and raise bellows until filled with air.
 - (b) Press down to compress the bellows until chest wall rises.
 - (c) Release pressure at once by raising (expanding) the bellows.
 - (d) Repeat this procedure of expanding and compressing the bellows at the rate of 18 times per minute.
 - (e) When the patient makes breathing efforts, compress the bellows as he breathes in.
6. When resuscitation is attempted with the patient on his side or abdomen, turn the head to the side and use the bellows with the mask-elbow.
7. To use oxygen, attach supply tube to inlet valve on the bellows.

INVESTIGATIONS

One physician having had experience with this device reported that it was tested on a number of dogs that were asphyxiated. Controlled experiments were run using other kinds of mechanical apparatus for production of artificial respiration and also manually controlled appliances which are attached to anesthetic apparatus. The Kreiselman bellows type resuscitator was found to be as efficient as any of the other apparatus tried. The same physician said that the bellows resuscitator had been used successfully on 12 patients, all of whom had experienced respiratory arrest by inhalation of anesthetic agents. He reported that (1) asphyxia was not present in any of these cases, (2) all of the 12 patients were successfully and efficiently revived with the bellows type apparatus, (3) none of the patients died, (4) respiratory arrest in these patients was produced by an overdose of an anesthetic agent for the expressed purpose of testing the apparatus and (5) no impairment to the patient's lungs was noted either immediately or later.

The Kreiselman (bellows type) apparatus together with the evidence submitted with it by this firm was referred to the Council investigator for examination and report. He stated that the device was used over a considerable length of time on patients purposely prepared for trial by stopping their respiration. The apparatus does what it is expected to do; namely, inflates the lungs with either air or oxygen under moderate positive pressure. The maximum pressure is controlled by a safety valve and is set to open long before dangerous pressures are reached.

The manufacturer expressed a desire to supply this apparatus to police and fire departments and other lay organizations that perform emergency artificial respiration on victims of drowning, gas poisoning, electric shock and so on. The firm was asked to submit reports of cases of asphyxia in which the device has been used successfully by lay operators in emergency cases. The firm replied that it was collecting these data but to date did not have enough records to satisfy the Council requirements.

The Council on Physical Medicine voted to accept the Kreiselman resuscitator for use in operating rooms and in medical institutions under the direction of a physician but voted not to accept it for use by lay organizations, because evidence is not available that a layman has successfully resuscitated an asphyxiated person with it.



Bellows resuscitator.

THE FISCHER CRYSTAL SHORT WAVE DIATHERMY APPARATUS, MODEL VC, ACCEPTABLE

Manufacturer: The H. G. Fischer Company, 2323-2345 Wabansia Avenue, Chicago 47.

This apparatus applies heat to the tissues of the body for the treatment of disease. Where heat is indicated as a therapeutic measure, this appliance may be used. So far as it is known the immediate and only effect of medical diathermy is the production of heat, and the physiologic effects are those which normally follow the production of heat in the living tissues. This medical diathermy apparatus is built to meet not only the requirements of the Council on Physical Medicine but the requirements of the Army Medical Corps as laid down in the Federal Standard Stock Catalogue, section IV, part 5.

Model VC is a so-called crystal controlled apparatus. The frequency, 13,660 kilocycles per second (21.95 meter wavelength), does not, according to reliable evidence, vary from the norm more than 0.05 per cent; in fact, the tolerance of frequency stability is much less, and this under wide temperature and humidity variations.

The generator consists of a steel cabinet with an enamel finish, a steel chassis which may be removed and a control panel mounted to the chassis with all controls thereon. The chassis consists of three units; namely a crystal control, a buffer and a final amplifier. The crystal control and buffer compartment may be removed from the chassis for repair or replacement by removing a screw at the base clamp of the buffer compartment. When the crystal is removed, the entire generator is disconnected from the power supply. An overload switch is also provided to protect the unit against short circuits. Connections for treatment electrodes are provided at the side of the unit. Treatment is applied by means of a cable or drum. It weighs approximately 200 pounds.

The ability of the apparatus to heat tissue was tested in a laboratory acceptable to the Council. The report is as follows:

The method followed was: 3 turns of cable around thigh, overall measurements 7 to 8 inches, one hand towel and $\frac{3}{8}$ inch layer of felt between cable and skin. Skin hyperemia was observed.

TABLE 1.—Cable Technic

Experiment Number	Deep Muscle Initial	Temperature of Final	Oral Temperature, F.	
			Initial	Final
1.....	97.1	106.5	98.3	99.0
2.....	97.4	106.2	98.3	99.2
3.....	97.4	107.0	98.3	99.5
4.....	97.5	104.9	98.6	99.7
5.....	97.6	104.7	98.8	99.8
6.....	97.6	105.4	99.0	100.0
Average.....	97.4	105.8	98.5	99.5

TABLE 2.—Disk Technic

Experiment Number	Deep Muscle Initial	Temperature of Final	Oral Temperature, F.	
			Initial	Final
1.....	97.0	104.2	98.5	98.4
2.....	97.6	104.3	98.4	98.7
3.....	97.3	104.0	98.5	98.8
4.....	97.7	105.5	98.8	99.1
5.....	97.8	105.5	98.8	99.4
6.....	97.8	105.0	98.9	99.5
Average.....	97.5	104.9	98.6	99.0

The method followed for the disk technic was: 10½ inch diameter disk applied obliquely to the thigh with one layer of toweling between surface of disk and the skin, center of disk opposite center of cannula. Blebs were produced as the result of point heating.

Heating-load test reveals that the transformers meet the requirements of the Council. The report from a laboratory recognized by the Council as qualified to judge on the frequency stability indicates that the crystal control feature maintains a stability within 0.05 per cent.

The apparatus operates on 115 volts alternating 60 cycle current. The lamp load test shows an output of 200 watts. On practical test the apparatus proved to stand up well when used clinically.

The Council on Physical Medicine voted to accept the Fischer Crystal Short Wave Diathermy apparatus, Model VC, for inclusion in its list of accepted devices.

Council on Foods and Nutrition

The following report, authorized by the Council for publication, represents the completion of the study of the nutritive value of prepared cereal foods made under a grant of the Board of Trustees at the request of the Council.

GEORGE K. ANDERSON, M.D., Secretary.

VITAMIN CONTENT OF PREPARED CEREAL FOODS

GEORGE KITZES, Ph.D.

AND

C. A. ELVEHJEM, Ph.D.

MADISON, WIS.

A preliminary report on the thiamine, riboflavin and niacin content of a number of prepared cereal products was published in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, Dec. 4, 1943. More extensive data are tabulated in the accompanying table. Some new products have been included, but the main purpose of the additional work was to determine the variation in the vitamin content of the typical products on the market. The cereals were purchased from grocery stores in different parts of Madison and from stores having a rapid turnover in order to avoid products kept on the shelves for long periods of time. Most of the samples were obtained at three different periods, spring, summer and fall of 1943. The thiamine was determined by the thiochrome method¹ and the riboflavin and niacin by microbiologic procedures.²

The values for whole grains are included again for comparison. The products to which restorative additions of synthetic vitamins or vitamin concentrates have been made are indicated with an asterisk. Others enriched according to proposed federal standards of enrichment are appropriately indicated. When the individual samples gave values within rather narrow limits, one average figure is given; when a greater variation was observed, the range of figures is included.

The variation between samples of the same product purchased at different periods is surprisingly small. The restored and enriched products gave the most variable results, owing undoubtedly to the higher vitamin content and to difficulties in obtaining uniform distribution of the added vitamins. Some of the products low in thiamine also showed considerable variation, probably because of differences in the degree of processing.

It is interesting to note that a large percentage of the wheat products and practically all of the corn, oats and rice products contain levels of thiamine within the range for the whole grains. Very few of the riboflavin values fall below the corresponding minimum whole

From the Department of Biochemistry, College of Agriculture, University of Wisconsin.

Published with the approval of the director of the Wisconsin Agricultural Experiment Station.

1. Hennessy, D.: The Determination of Thiamine in Cereal Products. *Cereal Chemist Bull.* 2, 1942.

2. Strong, F. M., and Carpenter, L. E.: Preparation of Samples for the Microbiological Determinations of Riboflavin, Indust. & Engin. Chem. (Anal.) 14: 909, 1942; Krehl, W. A.; Strong, F. M., and Elvehjem, C. A.: Determination of Nicotinic Acid, *ibid.* 15: 471, 1943.

ACC. No. 46

grain values. The biggest discrepancy occurs in the niacin values for wheat. Very few of the products, even when the vitamin has been added, meet the minimum values of 5.4 mg. for 100 Gm. The reason for this is readily evident. Wheat bran is very rich in niacin, and the bran is generally removed in the preparation of the wheat products. Further consideration may have to be given this standard, but in any case a product design-

of uniformity in the expression of nutritional values on the package was quite apparent. Some are expressed in terms of the average serving, others as a 1 ounce serving or on a pound basis, giving the percentage of the minimum daily requirements in some cases and in others the milligrams or international units contained therein. It is difficult or impossible for the average person to make an intelligent comparison of the nutri-

Vitamin Content of Whole Grains

A majority of samples of whole grains contain the indicated nutrients in amounts within the following ranges
(Data Compiled by the Food and Nutrition Board, National Research Council)

Product	Thiamine (Expressed as Mg. per 100 Gm.)	Riboflavin (Expressed as Mg. per 100 Gm.)	Niacin
Wheat, whole	0.44 to 0.66	0.09 to 0.20	5.4 to 8.0
Corn, whole	0.37 to 0.53	0.08 to 0.24	1.7 to 2.7
Oats	0.60 to 0.88	0.12 to 0.17	0.88 to 1.8
Rice	0.33 to 0.56	0.08 to 0.25	4.4 to 6.6

Vitamin Content of Prepared Cereal Foods

Products Derived from Wheat	Manufacturer	Thiamine (Expressed as Mg. per 100 Gm.)	Riboflavin (Expressed as Mg. per 100 Gm.)	Niacin
All-Bran	Kellogg Company	0.37 to 0.52	0.36 to 0.48	16.0 to 18.5
Post's Bran Flakes *	General Foods Corporation	0.45 to 0.55*	0.21 to 0.29	7.5 to 9.0
Chef White Wheat Cereal	IOA Foods	0.06	0.06	1.0
Coco-Wheats *	Little Crow Milling Company	0.39 to 0.48*	0.07	1.9 to 2.3*
Cracked Wheat	Doughboy Mills, Inc.	0.44	0.16	4.4
Cracked Wheat	IOA Foods	0.40	0.17	4.5
Cream of Wheat **	Cream of Wheat Corporation	0.41 to 0.68*	0.06 to 0.10	1.6 to 2.0*
Farina **	Pillsbury Flour Company	0.40*	0.05	2.0*
Force	The Best Foods, Inc.	0.04	0.16	4.1
Grape-Nut Flakes *	Post Products	0.52*	0.17 to 0.26	4.9 to 5.6
Grape-Nuts Wheat Meal *	Post Products	1.02*	0.12	5.1
Grape-Nuts *	Post Products	0.81*	0.17 to 0.20	3.9 to 4.9
Hecker's Cream of Farina **	The Best Foods, Inc.	0.40*	0.06	2.4*
Krumbles	Kellogg Company	0.02 to 0.07	0.16 to 0.21	4.2
Maltes Cereal	Maltes Company	0.35	0.13 to 0.17	4.5
Malt-O-Meal *	Campbell Cereal Company	0.40 to 0.60*	0.25 to 0.32*	2.7 to 3.5*
Pep *	Kellogg Company	1.2 to 1.5*	0.16 to 0.25	4.5 to 6.5
Puffed Wheat Sparkies *	Quaker Oats Company	0.40 to 0.54*	0.12 to 0.16	8.4*
Ralston Whole Wheat Cereal †	Ralston Purina Company	0.53	0.14	4.0 to 5.1
Rollad Wheat	Doughboy Mills, Inc.	0.37	0.13	4.1
Rollad Wheat	IOA Foods	0.32	0.14	4.0
Rollad Wheat (Pettijohn's)	Quaker Oats Company	0.31 to 0.40	0.13 to 0.16	3.8
Shredded Ralston	Ralston Purina Company	0.11 to 0.16	0.13	4.2
Shredded Wheat	Kellogg Company	0.19 to 0.23	0.14 to 0.19	4.5
Shredded Wheat	National Biscuit Company	0.24	0.13 to 0.15	4.2
Shreddies	National Biscuit Company	0.20	0.12	4.0
Wheatena	Wheatena Company	0.06 to 0.13	0.15	4.0
Wheaties *	General Mills Company	0.39 to 0.60*	0.19 to 0.22*	4.1 to 5.1
Wheatworth	National Biscuit Company	0.50	0.13	4.8
Products Derived from Corn				
Corn Flakes *	Kellogg Company	0.39 to 0.45*	0.08	1.6*
Corn Flakes *	Post Products	0.23 to 0.40*	0.10	1.3
Kix *	General Mills Company	0.44 to 0.59*	0.10 to 0.20	2.1 to 2.7*
Products Derived from Oats				
Cheerios *	General Mills Company	0.81*	0.25*	2.0*
H-O Quick Oats	The Best Foods, Inc.	0.67	0.17	0.85
Mother's Oats	Quaker Oats Company	0.61	0.17	0.85
Quaker Oats *	Quaker Oats Company	0.63 to 0.90*	0.11 to 0.15	0.60 to 0.7
Quick Quaker Oats	Quaker Oats Company	0.58 to 0.70	0.14 to 0.18	0.83 to 1.0
Products Derived from Rice				
Cream of Rice	Grocery Products Mfg. Company	0.16	0.08	1.7
Cream of Rice *	Grocery Stores Product Sales Co., Inc.	0.94*	0.62*	6.3*
Puffed Rice Sparkies * (new)	Quaker Oats Company	0.64*	0.06	4.6*
Rice Krispies *	Kellogg Company	0.45*	0.07	8.0*
Rice-Natural Brown	Comet Rice Mills	0.41	0.09	4.4
Products Not Otherwise Classified				
Cerevim * †	Lederle Laboratories	2.1*	3.3*	20.3*
Cream of Rice	Fruen Milling Company	0.12	0.17	0.92
Life of Wheat-Wheat Germ	Life of Wheat Company	2.3	1.0	4.5
Scotch Brand Barley (Pearled)	Quaker Oats Company	0.15	0.07	2.7
Soya Wheat	Soya W	0.71	0.27	3.4
Viobin Wheat Germ	Viobin	3.0	1.2	5.5

* Restorative addition of synthetic vitamin or vitamin concentrate.

** Enriched with synthetic vitamins or vitamin concentrates to conform with proposed federal standards of enrichment.

† Added wheat germ.

nated as containing added niacin should contain more than 4 mg. per hundred grams.

In summary it is evident that the cereal manufacturers have made excellent progress in improving and standardizing their products. Sufficient data are now available to allow rather accurate estimation of the amount of thiamine, riboflavin and niacin contributed by most of the commercial products.

In the process of handling the numerous brands of prepared cereal foods which were examined, the lack

tional content of the various cereal products by examining the labels. On the other hand, if these values could be expressed on the uniform basis of the average 1 ounce serving with the nutritional content in terms of percentage of daily requirements as well as actual milligrams (or international units for vitamins A and D) supplied, a better understanding and appreciation by the housewife and nutritionist of the food value of the various types of cereal products would be realized.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - CHICAGO 10, ILL.

Cable Address - - - "Medic, Chicago"

Subscription price - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, SEPTEMBER 9, 1944

THE CHICAGO VIVISECTION FUROR

For some weeks Chicago has been treated to a spectacle such as only Chicago can furnish, because the self-elected star of the performance is Irene Castle, once noted as half of a terpsichorean team and now maintaining a somewhat aging reputation by periodic appearances in the limelight in behalf of a dog shelter called Orphans of the Storm and in behalf of a general attack against all experiments with animals. Listed in the supporting cast is Mr. William Randolph Hearst of California and New York, who places the *Chicago Herald American* and all its staff at Miss Castle's disposal during the run of the play. Fortunately for the American people and fortunately also for the scientific medical institutions of Chicago, every other newspaper in the city has recognized the menace of the Castle-Hearst combination and has come to the support of the Chicago leaders of medical education with the amount of space and the vigor demanded by the antivivisectionist shrieking. The pity of it all is that so much important space and time should have to be devoted in the war effort to meeting this stupid and obsolete sentimentalism.

The City Council of Chicago a good many years ago passed an ordinance that makes available the use of stray dogs for scientific medical study. Apparently some of the aldermen have been high pressured by Mr. Hearst's campaign into introducing an amendment to the city code which would make it difficult or impossible for medical science to get the necessary number of dogs to carry on. Specifically, it proposes to repeal the ordinance under which stray dogs in the city pound go to medical schools because their owners fail to reclaim them after five days.

The campaign of the *Herald American* featured what was said to be the eye witness story of a former employee of the medical school of the University of

Chicago. This man had served as an animal caretaker for only six weeks and left his position without notice just a few days before the first article appeared in the *Herald American*. Apparently he had used his time to take pictures surreptitiously—pictures which were harmless in themselves but which were made to appear brutal and improper by the captions printed under them. The evidence is positive that the laboratories in question utilize animals with the utmost discrimination, without subjecting them to unnecessary pain or discomfort, carrying out all operative experiments under anesthesia and in accordance with the same standard of procedure that is used in hospitals everywhere throughout the country. The attack was centered on Dr. Dallas B. Phemister, professor of surgery, whose character and reputation as a distinguished scientist need no defense. The fact that the attack would be centered on a surgeon of distinction for his scientific accomplishments and his devotion to the healing of disease is an indication of the stress to which the antivivisectionists were put in order to make any kind of case whatever. Opposed to the ridiculous presentation which the antivivisectionists made before the city council were the professors of physiology in all the medical schools, the statements of the Surgeons General of the Army, Navy and U. S. Public Health Service and the personal appearance of Major General George F. Lull, Deputy Surgeon General of the Army. The incident served to bring out the tremendous advancement that medical science has made in recent years, largely by the use of animal experimentation. Long since and repeatedly it has been emphasized that dogs themselves have benefited, as well as has man, by the very experimentation that this illogical group condemns.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION wishes to commend the medical scientists of Chicago for having given so much of their time and their energy to meeting this challenge. The preparation which they made for the hearings before the city council, with the attendance of all the medical students of the city in uniform at the sessions, the orderly and painstaking presentation of the case, may well be models for similar efforts when a similar challenge happens to arise elsewhere in the nation or even in Washington. Yet it all comes down to a paragraph from a statement in an editorial in the *Chicago Tribune*, which gave many columns to interviews and editorials during the weeks preceding the hearing.

The *Tribune* said:

There comes a time when patience with people like this ceases to be a virtue. It is no excuse to plead for them that they are sincere. So, probably, is Hitler, who is no crazier than some antivivisectionists.

STREPTOTHRICIN

In 1941 Waksman of the New Jersey Agricultural Experiment Station isolated a bactericidal substance from a soil streptothrix (*Actinomyces lavendulae*), which he named "streptothricin."¹ Streptothricin is completely adsorbed on charcoal from a fluid culture medium from which it can be recovered by treatment with dilute acid. Waksman found that the crude product thus prepared had a definite inhibitory action on the majority of the bacterial species he tested. As little as 0.1 mg. of the product added to 10 cc. of nutrient agar completely prevented the growth of *Escherichia coli* and many other gram negative bacteria. Gram positive bacteria were of variable resistance, some being extremely sensitive to this bacteriostatic agent while others were highly refractory. Streptothricin also had a decisive antibiotic action against numerous fungi and yeasts.²

A preliminary report on the therapeutic efficiency of this bacteriolysin has been made by Robinson and his associates³ of the Merck Institute for Therapeutic Research, Rahway, N. J. The crude streptothricins tested by these investigators varied in potency from 5 to 300 units per milligram, the unit being the minimum quantity of the crude product which added to 1 cc. of nutrient broth completely inhibits the growth of a selected strain of *E. coli*. The toxicity of these products was tested by administering a single dose intravenously, subcutaneously or by mouth to each of a selected group of 10 mice. Mice given as much as 30,000 units per kilogram of body weight intravenously, 60,000 units subcutaneously or 250,000 units orally showed no evidence of toxicity. When twice these doses were administered, anorexia accompanied by a gradual loss of weight was noted in most of the mice, with a 20 per cent mortality.

Confirming Waksman's data, the bacteriostatic titers were determined by incorporating various amounts of each product in melted blood agar and streaking the surface of the solidified agar with a variety of pathogens. The minimum amount of streptothricin necessary for bacteriostasis varied with different bacterial species. *Eberthella typhi* was completely inhibited by as little as 4 units of streptothricin per cubic centimeter, while *Escherichia coli*, *Staphylococcus aureus*, *Salmonella schottmülleri*, *Diplococcus pneumoniae*, *Bacterium flexneri* and certain strains of *Streptococcus haemolyticus* required from 16 to 32 units. *Streptococcus viridans* and *Streptococcus lactis* were refractory, 1,024 units giving only partial growth inhibition. Intermediate groups included several strains of *Streptococcus haemolyticus*, *Staphylococcus aureus*, *Neisseria meningitidis*, *Proteus vulgaris* and *Aerobacter aerogenes*.

Therapeutic tests were made on groups of 30 to 60 mice. Each mouse was inoculated intraperitoneally with 10,000 lethal doses of a selected pathogen. Treatment was begun immediately after inoculation. The therapy consisted of either a single or a repeated dose of streptothricin given intravenously, subcutaneously or by mouth. A single dose of 50 to 100 units (a tenth of the toxic dose) given subcutaneously shortly after inoculation apparently affords complete protection against *Salmonella schottmülleri*, *Escherichia coli* and *Bacterium shigae*, while 3,000 units was required for the same therapeutic effect if the drug was given by mouth. With relatively refractory micro-organisms, such as *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Diplococcus pneumoniae*, practically no beneficial effects were noted, even when the dose was increased tenfold, i. e. approaching the toxic range. It was also noted that streptothricin given by mouth reduces the normal lactose fermenting flora of the gastrointestinal tract.

Robinson suggests that in time streptothricin may prove to be of value in the treatment of bacillary dysentery, typhoid and colon infections. If so, it would function as a valuable supplement to penicillin, which has little or no therapeutic action against these gram negative infections.

ABORTIVE OR NONPARALYTIC
POLIOMYELITIS

Fortunately the most frequent clinical form of poliomyelitis is the abortive or nonparalytic. Similar transitory infections may occur in the experimental disease in monkeys. In both cases the absence of paralysis is not necessarily due to failure of the virus to invade and multiply in the tissues of the central nervous system but to limitation of its spread therein. The limitation may depend on the virus, on the host or on both. Faber, Silverberg and Dong¹ studied the resistance to a strain of virus of the cynomolgus monkey under well controlled experimental conditions. They found that nontraumatic exposures to the virus of the respiratory and alimentary mucous membranes of cynomolgus monkeys may be followed by a definite resistance to later intracerebral inoculations of the virus. In such cases typical lesions were found in the central nervous system descending from the level of the inoculation into the brain stem and to a much more limited extent into the cord. There were no indications of any invasion of the central nervous system previous to the intracerebral inoculation, but lesions were found in the peripheral ganglions corresponding to the mucous membranes previously exposed to the virus.

1. Waksman, S. A., and Woodruff, H. B.: *Proc. Soc. Exper. Biol. & Med.* **49**: 207, 1942.

2. Foster, J. W., and Woodruff, H. B.: *Arch. Biochem.* **3**: 241, 1943.

3. Robinson, H. J.; Graessle, O. E., and Smith, D. G.: *Science* **99**: 510 (June 30) 1944.

1. Faber, H. K.; Silverberg, R. J., and Dong, L.: *Poliomyelitis in the Cynomolgus Monkey. II. Resistance to Spread of Infection in the Central Nervous System Following Exposures of Mucous Membranes to Virus, with Comments on Nonparalytic Poliomyelitis*, *J. Exper. Med.* **78**: 519 (Dec.) 1943.

This limitation of spread of experimental poliomyelitis in monkeys resembles the stop in the evolution of human poliomyelitis which results in the clinical gradations represented by abortive, nonparalytic and mildly paralytic forms of the disease. It may be assumed that natural exposures to the virus lead to increase in the resistance to its invasion of the central nervous system, possibly due to the development of specific antibodies. Whether natural human exposures to the virus which do not result in clinical poliomyelitis may leave lesions in peripheral ganglions, as was the case in the experiments on monkeys, is a question. Post-mortem study of these ganglions, especially in children, with this question in mind might well be worth while.

At present there seems to be no practical way of increasing successfully the resistance to human poliomyelitis by artificial means. Previous efforts to that end led to the conclusion that the injection of killed virus is not effective. A safe method of immunizing with modified living virus has not yet been found.

AIR BORNE POLIOMYELITIS

The epidemiology of human poliomyelitis has recently directed attention largely to the presence of the virus in feces and sewage and to the growing conviction that infection with poliomyelitis virus is usually by way of the alimentary tract. The demonstration by Faber and his associates¹ of Stanford University of the ease with which the upper portions of the alimentary tract of monkeys can be penetrated by the virus has intensified this concept. A modification of this belief will presumably follow recent studies of the virus content of nasopharyngeal secretions of clinical cases and attempts to infect experimental animals with air borne virus. Up to five years ago, out of 287 clinical trials the virus of poliomyelitis had been isolated but 29 times from the human nasopharynx.² Paul³ concluded from such data that less than 6 per cent of the poliomyelitis patients had viable virus on the nasopharyngeal surfaces, an insignificant percentage when compared with the great frequency with which the same virus is present in the stools or colonic washings in clinical cases.

A different perspective is suggested by a resurvey currently reported by Howe and his associates⁴ of Johns Hopkins University. Howe discarded the nasopharyngeal irrigation technic of earlier investigators and obtained secretions from the posterior wall of the oropharyngeal surface and the peritonsillar areas by means of cotton swabs. The two swabs used with each

patient were detached, dropped into 1 cc. of sterile water and stored on solidified carbon dioxide. The two swabs were afterward eluted in phosphate buffer solution and the fluid pressed out or sucked out by a syringe. The resulting fluid was rendered bacteriologically sterile by a thirty-six hour contact with a quarter volume of ether, after which the ether was removed. The yield was usually 1.1 cc. of fluid from each patient. The entire specimen was inoculated intracerebrally into a rhesus monkey, half of the sample being injected into each lateral thalamus. This region was chosen because of its relatively high susceptibility to the virus and because its deep position minimized the danger of leakage or backflow.

Specimens have been tested from 14 random cases of juvenile poliomyelitis, all tests being made during the first week of the disease. Of this group 7 specimens produced typical and usually lethal poliomyelitis in rhesus monkeys, the positive results being equally distributed between paralytic and nonparalytic human cases. If fully confirmed, this high percentage would suggest that nasopharyngeal secretions play a much more important role in the spread of poliomyelitis virus than had been previously concluded. Many human cases would presumably be due to air borne droplet or dust infection.

This suggestion is made highly plausible by studies of the infectivity of air borne poliomyelitis virus, currently reported by Faber and his associates⁵ of Stanford University. The Stanford experimenters used an improved atomizing flask into which a virus suspension can be delivered as a fine spray. All unevaporated droplets are retained in the flask and an even suspension of dry droplets or "droplet nuclei" passed into a large respiratory chamber. This chamber accommodates the heads of 4 monkeys under anesthesia with pentobarbital sodium. After one hour exposure to the virus infected air 5 of the 7 rhesus and 6 of the 7 cynomolgus monkeys thus far tested developed typical poliomyelitis. Histologic evidence indicated that the virus had entered the central nervous systems of all 11 monkeys through the olfactory nerves. To study other possible respiratory ports of entry the test was repeated on 35 rhesus and 10 cynomolgus monkeys in which olfactory blockade had been induced by previous application of 1 per cent zinc sulfate. Of these, 2 rhesus monkeys and 4 cynomolgus monkeys developed typical poliomyelitis. Serial sections indicated that the non-olfactory port of entry was in most cases through the afferent fibers of the fifth cranial nerve, entrance by way of the local sympathetic fibers being demonstrated in but 1 case.

Faber concludes from these tests that the concept of poliomyelitis as an air borne disease acquired by inha-

1. Faber, H. K.; Silverberg, R. J., and Dong, L.: *J. Exper. Med.* 78: 499 (Dec.) 1943.

2. Vignec, A. J.; Paul, J. R., and Trask, J. D.: *Yale J. Biol. & Med.* 11: 15 (Oct.) 1938.

3. Paul, J. R.: *Infantile Paralysis*, a symposium delivered at Vanderbilt University, Waverley Press, Lecture 5, p. 127, 1941.

4. Howe, A. A.; Wenner, H. A.; Bodian, D., and Maxcy, K. F.: *Proc. Soc. Exper. Biol. & Med.* 56: 171 (June) 1944.

5. Faber, H. K.; Silverberg, R. J., and Dong, L.: *J. Exper. Med.* 80: 39 (July) 1944.

lation of contaminated air or dust deserves more consideration. Such a view, he emphasizes, does not exclude ingestive infection, since experiments have shown that in monkeys infection occurs with equal ease by the two ways. Which mode of infection is the more important for man is a problem that still awaits solution.

MALNUTRITIONAL ANTIVIRAL IMMUNITY

Reasoning from experimental evidence obtained from a study of bacterial infections, many clinicians have assumed that resistance to pathogenic viruses would be lowered as a result of dietary deficiency and that prophylactic effects would follow the administration of corrective doses of such factors as ascorbic acid, thiamine, riboflavin, nicotinic acid and pantothenic acid. This line of reasoning was challenged in 1939 by Foster and his associates¹ of the department of pediatrics, University of Pennsylvania School of Medicine, who studied the effects of thiamine deficiency on resistance to poliomyelitis virus.

Litters of white mice varying from 21 to 31 days of age were split into two groups. One group was fed ad libitum a standard diet containing 100 micrograms of thiamine per hundred grams. The second group was placed on a similar diet in which the thiamine content had been reduced to 10 micrograms per hundred grams. Fifteen to twenty days later each mouse was injected intracerebrally with 0.03 cc. of a 0.5 per cent suspension of virus infected mouse brain (Lansing strain), control injections being made with 0.5 per cent suspension of normal mouse brain. Typical paralysis was noted in 74 per cent of the mice at the optimum thiamine level, as contrasted with but 13 per cent paralysis in the thiamine deficient group.

With a third group of mice the thiamine content of the ingested food was raised to 30 micrograms per hundred grams (minimum maintenance level). In this group 17 per cent of the injected mice developed paralysis. The conclusion was drawn that even a partial reduction in optimum thiamine intake increases resistance to poliomyelitis virus. Foster² subsequently found that mere restriction of caloric intake without reduction in ingested thiamine resulted in a similar though less definite increase in resistance to poliomyelitis.

These results were afterward confirmed by Rasmussen and his associates³ of the University of Wisconsin, who tested four carefully selected mouse groups. The first group was fed a synthetic diet containing optimum amounts of all necessary food factors except thiamine. On this diet the mice developed an acute deficiency, characterized by rapid loss of weight. A

second group of mice was fed the same diet plus a minimum maintenance amount of thiamine (30 micrograms per hundred grams), on which diet the weight remained constant for at least thirty days. A third group was fed the same diet plus an optimum amount of thiamine (200 micrograms per hundred grams). On this diet the weight increased rapidly. A fourth group was fed an excessive amount of thiamine (600 micrograms per hundred grams). Thirteen days after the animals had been placed on these diets each mouse was injected intracerebrally with 0.03 cc. of a 2 per cent brain-cord suspension of the Lansing mouse adapted poliomyelitis virus. Within fourteen days 81 per cent of the mice at the optimum or excessive thiamine level developed paralysis, while but 14.2 per cent of those on the thiamine free diet became paralyzed. Of those at the minimum maintenance level 50 per cent became paralyzed.

Rasmussen also tested a fifth group of mice in which there was a restricted caloric intake without a reduction in the thiamine or other vitamin factors. The control morbidity of 81 per cent was reduced to 65 per cent in this group. The Wisconsin bacteriologists then broadened their field of research to include tests with Theiler's encephalomyelitis virus injected intraperitoneally. Here the differences in resistance were of the same order but less pronounced than with poliomyelitis virus, the control morbidity of 55 per cent being reduced to 42 per cent as a result of thiamine deficiency. The field of research was then widened to include the effects of restricted intake of pantothenic acid.⁴ They found that Swiss mice fed a synthetic ration deficient only in calcium pantothenate exhibited a definitely increased resistance to Theiler's encephalomyelitis virus. There was, however, little or no increased resistance to poliomyelitis virus.

A theory to account for this malnutritional antiviral immunity was suggested in 1942 by Sprunt⁵ of Duke University, who studied the resistance of undernourished rabbits to intradermal injection with vaccinia virus. In all cases the resulting lesions were fewer and smaller in the malnutrition group than in adequately fed controls. Sprunt interpreted this as evidence that vaccinia virus is less able to multiply in poorly nourished tissue cells than in adequately nourished cells. With this theory a malnutritional hypersusceptibility to bacterial infections coupled with a partial malnutritional immunity to virus diseases ceases to be paradoxical.

Sprunt's theory is based on the classic assumption that the virus particle is a living parasite feeding on or in competition with the invaded tissue cell. A more complex theory would be necessary if the virus was pictured as a giant protein molecule multiplied by the engrafted cell.

1. Foster, C.; Jones, J. H.; Henle, W., and Dorfman, F.: *Proc. Soc. Exper. Biol. & Med.* **51**: 215, 1942.

2. Foster, C.; Jones, J. H.; Henle, W., and Dorfman, F.: *Science* **97**: 207, 1943.

3. Rasmussen, A. F.; Waisman, H. A.; Elvehjem, C. A., and Clark, P. F.: *J. Infect. Dis.* **74**: 41 (Jan. Feb.) 1944.

4. Lichstein, H. C.; Waisman, H. A.; Elvehjem, C. A., and Clark, P. F.: *Proc. Soc. Exper. Biol. & Med.* **56**: 3 (May) 1944.

5. Sprunt, D. H.: *J. Exper. Med.* **75**: 297, 1942.

Current Comment

POSTWAR TRAFFIC DANGERS

Automobile traffic hazards will no doubt begin to increase almost at once after the end of the war. Methods to control this problem should receive careful consideration now. The National Safety Council has just published an excellent brochure on postwar traffic problems for a group of forty sponsoring organizations, including the American Medical Association. According to this booklet the long-term problems will include greater traffic volumes and speeds, probable changes in traffic and parking patterns, new developments in automobile design, continued if not increased night traffic hazards, and no anticipated decrease in the accidents resulting from drinking alcoholic beverages. Safety measures devised and instituted, although unevenly, before the war must be continued and implemented. Especially important will be training of adequate personnel to meet the new and perhaps unexpected problems which will surely arise. New measures must be introduced to cope with new problems. Road construction, betterment of existing streets and highways, and traffic engineering administration will play a part in preventive measures. New technics will have to be devised for police personnel and their equipment; standard technics of enforcement can be more widely adopted. Vehicle inspection, driver licensing, traffic safety instruction and education are additional measures which will require careful application. About 35,000 deaths and well over a million injuries annually from automobile accidents were recorded during recent prewar years; all evidence indicates that this cause of death and injury will rise to new heights in the postwar period unless adequate preventive measures are taken.

BIOLOGIC SYNTHESIS

The older view, championed by Liebig, considered that the chemistry of the animal body was destructive in character, whereas in plants widespread synthesis took place. Subsequent investigation has shown the fallacy of this concept; there is ample evidence that fat and carbohydrate are synthesized from unlike precursors, while purines, hormones and aminoacetic acid, among other compounds, are known to be products of biochemical synthesis in the animal body. The most recent evidence on this general point relates to beta-alanine, a nitrogenous constituent of the muscle extractives carnosine and anserine. Although alpha-alanine is a common amino acid obtained from most proteins, the beta analogue has been considered a biochemical novelty. Interest in this compound was increased when it was discovered¹ that it constitutes part of pantothenic acid, one of the vitamins of the B group. It becomes of interest to know whether or not the growing animal can synthesize the beta-alanine in its tissues. Using weanling rats, Schenck and du Vigneaud² have shown that the beta-alanine in the nonhepatic tissues increases some twenty times in the fifty days after weaning and

that this increase is independent of the amount of beta-alanine in the diet. As the tissue extractives assume greater importance in the metabolism of muscle—quantitatively the most important tissue in the body—the origin and availability of these compounds becomes of greater interest.

THE HETEROLOGOUS TRANSPLANTATION OF HUMAN CANCERS

Greene and Lund³ have reported successful transplantation of a series of 10 human cancers to the anterior chambers of eyes of guinea pigs. The series contained a fibrosarcoma of the chest wall, an adenocarcinoma of salivary gland tissue, a chondrosarcoma of the larynx, a malignant melanoma, an epidermoid carcinoma of the buccal mucosa, an adenocanthoma of the urethra, a mammary fibrosarcoma, an undifferentiated carcinoma of the lung, and an epidermoid carcinoma of the lung and a chordoma. The transplants grow progressively in the alien host and bear a close microscopic resemblance to the original tumors. In the majority growth became apparent in all successful transplants within several days. In earlier experiments with rabbit tumors the authors failed to transplant benign tumors or tumors in their preinvasive stage. Apparently, therefore, heterotransplantability may be a characteristic property of cancer. More recent experiments demonstrate that in man as well as in rabbit cancer autonomy or transplantability transcends species barriers. Numerous attempts to transfer benign human tumors to lower animals have failed. Transplantation experiments utilizing biopsy tissue from precancerous lesions and from anaplastic tumors during preinvasive stages likewise failed. Transplantability of malignant tumors to lower animals, it is pointed out, may serve as a diagnostic aid in a case of questionable tissues and assist in the morphologic classification of cancers. Cancers may be associated with local tissue reaction that obscures the nature of the cell involved in the neoplastic process. Thus the tissue obtained from the first biopsy of the fibrosarcoma of the chest wall in 1 of their cases contained a large number of giant cell forms and the question of muscular origin arose. However, only the fibroblastic elements survived guinea pig transfer, and it became clear that the growth was fibrosarcoma and that the giant cells were reactive rather than neoplastic in nature. It is also pointed out that transplants often show a slightly higher degree of cellular differentiation and organization than is found in the primary host and thus allow a classification of highly anaplastic tumors. This was demonstrated in their case of transplanted chordoma. The ability to grow cancer in lower animals affords an approach to many other problems associated with human tumors. After successful primary transplantation the cancer can be carried by serial passage to new generations of animals and subjected to a variety of investigations not permissible in the human host. After preliminary growth in the anterior chamber of the eye, transfer to other body regions is readily effected.

1. Williams, R. J., and Major, R. T.: *Science* **91**: 246, 1940.

2. Schenck, J. R., and du Vigneaud, V.: *J. Biol. Chem.* **153**: 511 (May) 1944.

3. Greene, Harry S. N., and Lund, Paul K.: *The Heterologous Transplantation of Human Cancers*, *Cancer Research* **4**: 352 (June) 1944.

MEDICINE AND THE WAR

ARMY

REORGANIZATION OF OFFICE OF SURGEON GENERAL

It has recently been announced from the office of the Surgeon General of the Army that the post of Assistant Surgeon General is to be filled by Brig. Gen. Raymond W. Bliss. The post is newly created as a part of a recent reorganization. General Bliss will hold the new post in addition to his duties as chief, Operations Service.

The Administrative Service is dissolved, as part of the reorganization: the Fiscal, Legal and Office Service Divisions will report directly to the executive officer as previously. In place of the Professional Service, four Professional Consultant Divisions are being created: medical, surgical, neuropsychiatric and reconditioning. All personnel of the Nursing Division, another division to be dissolved, and related aspects of the Army Nurse Corps will be the responsibility of the Army Nurse Branch of the Military Personnel Division, Personnel Service. The overall policy aspects of the Army Nurse Corps will be the responsibility of the newly constituted Nursing Division of the Professional Administrative Service.

A new Professional Administrative Service is being created, with Col. Arden Freer as chief and Col. Esmond R. Long deputy chief. The following will be included: Physical Standards Division, Nursing Division, Medical Statistics Division, Professional Inquiries Unit, Women's Health and Welfare Unit. Col. Florence A. Blanchfield will be director of the Nursing Division, Professional Administrative Services.

SURGICAL OPERATING TRUCKS TAKE HOSPITAL TO WOUNDED SOLDIERS

The Army Medical Department has established mobile surgical groups which provide hospital facilities for wounded soldiers near the front lines. The tent is carried on a two wheel trailer along with an electrical generating unit; the hospital vehicle can be made ready for full operation within thirty minutes. Sufficient room is provided for operating teams composed of surgeons, nurses and technicians, making it possible for 2 men to be operated on simultaneously. The unit is capable of caring for from 80 to 100 men a day. The truck is equipped with a variety of special instruments for orthopedic, nerve, chest, maxillofacial and brain surgery; operating tables, steam and dry sterilizers, lighting equipment, medicines, blood plasma, bandages and dressings, record files, auxiliary power unit, surgical linens and operating gowns.

MAJOR DUNN APPOINTED NEURO- PSYCHIATRIC CONSULTANT

Major William Harold Dunn has been appointed neuropsychiatric consultant for the Fifth Service Command Headquarters, Columbus, Ohio. Major Dunn was instructor in psychiatry at Cornell Medical College and assistant chief of the outpatient department at the Payne-Whitney Clinic in New York City. He has had extensive army experience with hospital units in the South Pacific. Immediately preceding his appointment he was on the staff of the School of Military Neuropsychiatry at the Mason General Hospital. Dr. Dunn graduated from Harvard Medical School in 1927.

NURSES DECORATED FOR GALLANTRY UNDER FIRE

Twelve officers of the Army Nurse Corps have been awarded the Bronze Star for heroic service in Italy, the War Department recently announced. This brings to 17 the number of American nurses who have been decorated for gallantry under fire. One Bronze Star and four Silver Star awards were made earlier.

CANCEL REQUISITION FOR PARASITOLOGISTS

Release FR-208, dated August 10, from the Headquarters Army Service Forces, Washington 25, D. C., states that the files of a sufficient number of qualified candidates have been received to meet the needs of the Surgeon General under requisition 228, parasitologists. This requisition will be canceled and further procurement will close immediately. Papers on candidates already procured and in process will be completed with the exception of WD AGO form 63, if not already accomplished, and forwarded under form OPS-22 with such requisition number shown in proper place.

CHIEF ARMY NURSE OF SIXTH CORPS AREA RETIRES

Lieut. Col. Pearl C. Fischer recently retired as chief of army nurses for the Sixth Service Command and was honored at a dinner at the Gardiner General Hospital, Chicago, August 8. Colonel Fischer was the first woman with that rank to serve with the Sixth Service Command. She will be succeeded by Lieut. Col. Martha Jane Clement, director of army nurses in the Southwest Pacific Area.

MAJOR MARY C. WALKER GIVEN HONORARY DEGREE

The University of Denver recently conferred the honorary degree of Doctor of Humane Letters on Major Mary C. Walker of the Surgeon General's Office. Mr. Thomas A. Dines, chairman of the board of trustees of the University of Denver, stated that "the university is pleased to extend this honor to a member of the nursing profession not only in recognition of her individual worth but as a fine representative of her profession."

SIXTY-NINE ARMY NURSES HAVE DIED IN LINE OF DUTY

The War Department recently announced that of approximately 40,000 members of the Army Nurse Corps 69 have lost their lives in line of duty since Pearl Harbor, 24 have been reported as wounded and 66 are prisoners of war. Six officers of the Army Nurse Corps have died as a direct result of enemy action. Other deaths have been due to vehicle accidents, airplane crashes and disease.

CHICAGO NURSE RECEIVES AIR MEDAL

Lieut. Helen F. Lyon of Chicago, a member of the first overseas flight nurse team, who went to the Aleutian theater last year to evacuate men wounded in the Attu campaign, has recently been awarded the Air Medal. With Lieutenant Lyon's unit when it arrived in the Aleutians was 2d Lieut. Ruth M. Gardiner, who was the first air evacuation nurse to lose her life in this war and after whom the Gardiner General Hospital was named.

FLIGHT SURGEONS' ASSISTANTS

A class of forty flight surgeons' assistants completed the six weeks course in aviation medicine at the School of Aviation Medicine, Randolph Field, Texas, July 29. These men are trained as specialists in assisting flight surgeons in the selection, care and maintenance of the flier. Brig. Gen. Eugen G. Reinartz is commandant of the School of Aviation Medicine.

FRENCH OFFICER CITED BY U. S. ARMY

Gen. Georges André Hugonot, Medical Corps, French army, was cited July 21 by the commanding general of the Fifth Army, U. S. He was serving as corps surgeon of the French Expeditionary Corps on the Italian front.

ARMY AWARDS AND COMMENDATIONS

Brigadier General Edgar Erskine Hume

Brig. Gen. Edgar Erskine Hume was recently awarded the Oak Leaf Cluster to the Distinguished Service Medal in recognition of service as chief of the Allied Military Government Section, Fifth Army, in Italy. The citation accompanying the award read:

"From Oct. 1, 1943 to Dec. 15, 1943, as chief of the Allied Military Government Section, Fifth Army, he successfully carried out one of the most extensive military government tasks ever accomplished by the United States, being charged with the government of Campania, a region of 6,000,000 inhabitants including Naples, one of Italy's largest cities. He made detailed plans for the administration of Naples, which, under his orders, were put into immediate execution when the city was taken on Oct. 1, 1943.

"Despite enormous handicaps in Naples, where the Germans had destroyed the water supply, electric power sources, drains and other public utilities, had mined buildings, despoiled hospitals, dispersed the police and in general paralyzed the civil administration, he was able by his unusual ability and devotion to duty to restore order forthwith and within a few weeks to return the city's functions almost to normal. A threatened epidemic of typhoid was averted by his wise preventive measures. Our victory was thus hastened, as the army commander was free to perform purely military functions without the added burden of civil government.

"The respect in which this officer was held by the Italians, his intimate knowledge of the country, its people and language, and his rare administrative skill and leadership made him unique in his efficient handling of an extremely difficult and politically delicate task."

General Hume was awarded the Distinguished Service Medal for his outstanding service as a medical officer during World War I as commissioner of the American Red Cross after the war in Serbia. He holds many decorations from foreign governments and numerous academic degrees from American and foreign institutions of learning.

General Hume graduated from Johns Hopkins University School of Medicine, Baltimore, in 1913 and was commissioned as a first lieutenant in the Medical Corps, Regular Army, Jan. 14, 1917.

Colonel Russell J. Caton

Col. Russell J. Caton, formerly of Bucyrus, Ohio, has received the Bronze Star for meritorious service at Guadalcanal, Solomon Islands, from May 13, 1943 to April 26, 1944. The citation reads "As island surgeon, Colonel Caton supervised and controlled medical service for thousands of troops at that base. In the supervision and coordination of twenty dispensaries and eleven hospitals he displayed unusual organizational ability, professional knowledge and leadership. He was directly responsible for the supply, storage and transport of medical equipment and supplies for operations on Guadalcanal and throughout the entire forward area. Under the expert guidance and force of purpose of Colonel Caton, the base medical service was developed to a widely extensive and efficient structure capable of meeting every exigency created by tropical climate and combat conditions. His careful planning and unerring sound judgment exemplify the highest tradition of the medical corps." Dr. Caton graduated from Ohio State University College of Medicine, Columbus, in 1913 and entered the service Feb. 1, 1941.

Colonel Frank B. Wakeman

The Legion of Merit was awarded posthumously to Col. Frank B. Wakeman, formerly of Indianapolis, for his meritorious work in connection with the training program of the Army Medical Department. The citation accompanying the award reads "For exceptionally meritorious conduct in the performance of outstanding services from July 1940 to March 1944. Colonel Wakeman, with rare foresight, initiative and organizing ability, laid the groundwork for the necessary expansion in all phases of Medical Department training, placing in operation replace-

ment training centers, service schools for officers, Medical Department enlisted technicians schools and an officer candidate school long before the entry of the United States into the war. As a result of his insight into medical requirements and the execution of plans, the Medical Department was able to expand greatly its training activities following Dec. 7, 1941 and also, because of the training already given, to render an efficient medical service to the Army during the very rapid expansion that followed the declaration of war. Colonel Wakeman's unusual foresight, aggressive execution of approved plans and selfless devotion to the best interests of the Army and the Medical Department are in the highest traditions of the service." Dr. Wakeman graduated from the Indiana University School of Medicine, Indianapolis, in 1926. The Association of Military Surgeons awarded him the Henry Wellcome Prize in 1938 for his thesis on an immunizing antigen of the typhoid bacillus.

Colonel John A. Rogers

Col. John A. Rogers, Army Medical Department, formerly on duty in Washington, D. C., as executive officer of the Office of the Surgeon General, has been awarded the Legion of Merit for services in the European theater. The citation stated that the award was given for "exceptionally meritorious conduct in the performance of outstanding services from Oct. 20, 1943 May 31, 1944." Dr. Rogers graduated from Tufts College Medical School, Boston, in 1914. He was formerly a member of the New Hampshire National Guard and entered the Medical Corps of the Regular Army in 1933, serving at posts in this country and in Hawaii.

Captain William I. Hunt

Posthumous award of the Silver Star Medal was recently made to Capt. William I. Hunt, formerly of Greenville, Miss. for gallantry in action. The citation accompanying the award read "Desiring to be where he was needed most, Captain Hunt accompanied a small reconnaissance patrol into Japanese territory. The patrol ran into an enemy ambush, which opened fire at a 30 yard range. During the action the lead scout was killed and three other men were wounded. Captain Hunt, disregarding his personal safety, courageously went forward under exposure to the heavy hostile fire toward the casualties and in doing so was mortally wounded. Although such bravery was neither ordered nor expected, this officer readily sacrificed his life in an attempt to help his wounded comrades." The organization to which Dr. Hunt belonged, the American Division, was the first army division to participate in offensive action in this war. Named for American forces in New Caledonia, where it was activated, it fought at Guadalcanal and is the only division officially with a name instead of a number. Dr. Hunt graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1942 and entered the service June 30, 1943.

Captain Ralph S. Phelan

The Silver Star award was recently given to Capt. Ralph S. Phelan, formerly of Waurika, Okla. The citation accompanying the award read "On Nov. 22, 1943, in the Mediterranean theater, he was battalion surgeon of an infantry battalion which was occupying a defensive position on a mountain top. Enemy artillery caused many casualties, and the rugged terrain made evacuation almost impossible. He went up the side of the mountain and administered first aid to the wounded in the battle area. His action under fire was credited with saving many lives." Dr. Phelan graduated from the University of Oklahoma School of Medicine, Oklahoma City, in 1939 and entered the service July 1, 1941.

Captain Andrew J. Extejt

The Bronze Star Medal was recently awarded to Capt. Andrew J. Extejt, formerly of Toledo. Dr. Extejt was decorated for military operations against the enemy in Normandy June 7-10. He has been overseas for more than a year and also saw action in Africa, Sicily and Italy. Dr. Extejt graduated from St. Louis University School of Medicine in 1934 and entered the service Aug. 27, 1942.

NAVY

NAVY AWARDS AND COMMENDATIONS

Captain Lockhart D. Arbuckle

Capt. Lockhart D. Arbuckle, now senior medical officer at the Naval Training Center, Great Lakes, Illinois, has been awarded the Legion of Merit "for exceptionally meritorious conduct in the performance of outstanding services to the government of the United States as division surgeon of a Marine division during the planning for and the operations against the Japanese on Bougainville, British Solomon Islands, from Sept. 10, 1943 to Jan. 4, 1944. During this period Captain Arbuckle rendered invaluable assistance to the commanding general in executing the operation under the most adverse conditions. When the preparations for the establishment of the beachhead were begun, owing to his highly efficient supervision of the medical facilities all troops entered the combat areas in excellent physical condition. As a result of his exceptional professional skill and constant attention to duty, medical services were administered to all the wounded, and despite the trying conditions arising from tropical climate, losses from sickness and battle wounds among the troops were held to a minimum. His superior knowledge and sound judgment contributed materially to the success of the campaign and were in keeping with the highest tradition of the United States Naval Service." Dr. Arbuckle graduated from the Medical College of Virginia, Richmond, in 1915 and has been in the service since May 28, 1917.

Lieutenant Commander Richard Monroe Forsythe

Posthumous award of the Navy Cross has been made to Lieut. Comdr. Richard Monroe Forsythe, formerly of Cleveland. The citation accompanying the award read "For extraordinary heroism while serving as regimental surgeon with the . . . First Marine Division, during action against enemy Japanese forces near Volupai Plantation, Willaumez Peninsula, New Britain, on March 6, 1944. When our forces suffered severe casualties while landing on the strongly fortified beach, Lieutenant Commander Forsythe immediately went to the assistance of the wounded and, undeterred by devastating hostile mortar fire, untiringly administered medical aid to the injured and assisted in moving them out of range of Japanese guns. Courageously remaining in the exposed area despite multiple wounds from a bursting enemy mortar shell, he continued ministering to the injured until severe pain finally forced him to cease his valiant efforts. Although fully aware that postponed surgical attention would gravely impair his chance of recovery, Lieutenant Commander Forsythe steadfastly refused medical assistance while there were other casualties in need of care and later succumbed as a result of wounds received in this action. His outstanding professional skill, his great personal valor and heroic devotion to duty were an inspiration to his associates and reflect the highest credit on the United States Naval Service. He gallantly gave his life for his country." Dr. Forsythe graduated from Western Reserve University School of Medicine, Cleveland, in 1937 and entered the service May 31, 1940.

MISCELLANEOUS

MORE THAN 400 FROM POST-GRADUATE
HOSPITAL NOW SERVING WITH
ARMED FORCES

More than 400 physicians, nurses and others connected with the Post-Graduate Hospital, New York City, are now serving with the armed forces. The number of physicians attached to the Army, Navy and Marines in various battle fronts is one of the largest from any hospital in the country. Doctors from the attending staff of the hospital number 296, while there are 47 from the intern and resident units. In addition to these there are 47 nurses, who, like the doctors, are volunteers. One member of the hospital staff has been killed in action, and those drafted from the nonvolunteer group have reached a total of 36.

The Post-Graduate veterans now in uniform will often be reminded of their home service by the fact that they will use some of the flying ambulances for the transfer of their patients. Owing to the success of the "E bond" campaign conducted at the hospital, three of these great air ambulances will carry the name of the Post-Graduate Medical School and Hospital.

The medical school is engaged in arrangements for classes and courses for military doctors returning to their civilian practices, scores of whom have asked for this training.

RESTRICTIONS ON USE OF
AGAR REMOVED

The War Production Board recently announced that stockpiles of agar, formerly dependent on supplies received exclusively from Japan, have now been improved to such an extent by newly developed domestic production and by imports from Mexico that restrictions on the use of agar have been removed, by revocation of Order M-96. Agar, a jelly-like substance extracted from certain types of seaweed found on both the Atlantic and Pacific coasts, is principally used in making bacteriologic cultures, but only the seaweed found on the West Coast yields the type of agar that can be used for the production of these cultures. Agar is also used in the preparation of medicinals, pharmaceuticals and food, and in the drawing of tungsten wire and the manufacture of dental impression compounds.

Domestic production of agar was accomplished as a result of close cooperation between industry and the Chemicals Bureau of the War Production Board. The largest agar plants, the American Agar and Chemical Company, is situated in Los Angeles. Smaller agar production units have been established in Massachusetts, the Carolinas and Florida.

To insure fulfillment of any emergency needs for agar, a stockpile is being reserved by the Defense Supplies Corporation, a subsidiary of the Reconstruction Finance Corporation.

HOSPITALS NEEDING INTERNS
AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL September 2, page 37)

CALIFORNIA

Santa Clara County Hospital, San Jose. Capacity, 470; admissions, 4,435. Dr. Henry E. Dahleu, Superintendent (resident—tuberculosis).

KENTUCKY

Louisville General Hospital, Louisville. Capacity, 587; admissions, 9,805. Dr. John W. Moore, Medical Director (1 intern, 1 assistant resident—medicine, October 1).

MICHIGAN

Leila Y. Post Montgomery Hospital, Battle Creek. Capacity, 165; admissions, 6,301. Sister Mary Constance, Administrator (intern).

NEW YORK

Israel Zion Hospital, Brooklyn. Capacity, 380; admissions 10,532. Dr. J. Praeger, Executive Director (interns, October 1944, January 1945).

RHODE ISLAND

Butler Hospital, Providence. Capacity, 175; admissions, 178. Dr. Arthur H. Ruggles, Superintendent (residents—psychiatry).

TEXAS

All Saints Episcopal Hospital, Fort Worth. Capacity, 100; admissions, 3,997. Miss Eva M. Wallace, R.N., Superintendent (resident—mixed).

WISCONSIN

Methodist Hospital, Madison. Capacity, 127; admissions, 3,911. Miss Carolyn M. Fenby, R.N., Superintendent (interns).

URGENT SPECIAL MICROSCOPIC TESTS BEFORE TREATING GONORRHEA WITH PENICILLIN

Dr. C. J. Van Slyke of the Public Health Service Venereal Disease Research Laboratory, Staten Island, N. Y., and Dr. S. Steinberg of the U. S. Marine Hospital, New York City, recently reported the possibility of overlooking syphilis symptoms in gonorrhea patients treated with penicillin in patients who have both diseases. This can be avoided, however, if special microscopic tests are made before penicillin is used, and if blood tests are made after penicillin treatment has been completed. The masking effect of penicillin on syphilis symptoms is due to the fact that the relatively small amounts of penicillin required to cure gonorrhea are sufficient to cause disappearance of the spirochete germs of syphilis from syphilis lesions, although not sufficient actually to cure syphilis. When serum from the lesions is examined under a special microscope after penicillin has been used, the spirochetes will not be seen, and the examining doctor may be misled to conclude that the patient was not infected with syphilis. Making the microscope examination before treatment with penicillin prevents this possible error. A blood test for syphilis some time after the treatment of gonorrhea has been completed is advisable, because blood tests do not always reveal very new syphilis infections immediately after they have been acquired.

MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA

The Medical and Surgical Relief Committee of America (420 Lexington Avenue, New York City) recently donated a shipment of medical supplies, including five cases of fracture pillows, crutches, stretchers, wheel chairs and a fracture cradle for use of wounded soldiers, to the Halloran General Hospital, Staten Island, N. Y. The Medical and Surgical Relief Committee of America was organized four years ago and is conducted by a nationwide group of physicians, surgeons and dentists. The committee is a philanthropic organization dedicated to medical, surgical and dental aid for the armed and civilian forces of the United Nations. To date the committee has shipped and delivered safely in America more than \$640,000 of supplies.

PRINTED FORMS FOR CADET NURSES WHEN TRAVELING

Some members of the U. S. Cadet Nurse Corps have encountered transportation difficulties through being confused with members of the armed forces. In one instance a cadet nurse was unable to purchase a train ticket because a passenger agent, thinking her a member of some governmental service, requested to see furlough papers, which of course she did not have. This occasioned an expensive delay in her trip. In order to avoid this possible confusion the U. S. Public Health Service is printing forms which will be sent in the near future to directors of schools of nursing which (when signed) are to be given to cadet nurses who are traveling in uniform. This will clarify the situation for any agent who, in line of duty, might question their right to travel. Additional forms will be sent to the directors of schools of nursing on request.

COMMITTEE ON MEDICAL RESEARCH BEGINS PUBLICATION

The Committee on Medical Research of the Office of Scientific Research and Development began publication recently of a weekly journal entitled *Summary of Reports Received by the Committee on Medical Research*. Circulation of the publication is restricted to selected Medical Corps men in the United States, Canada and Great Britain. The journal is being edited and published by the records section of the committee, the work of which is directed by Dr. Kenneth B. Turner, who is on leave of absence from Columbia University College of Physicians and Surgeons.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

At Camp Ellis, Illinois: Conditions Affecting Glucose Metabolism, Drs. Arthur R. Colwell and George W. Scupham, September 20.

At Camp Grant, Illinois: Recent Advances in the Treatment of Syphilis, Drs. Robert M. Craig and George X. Schwemlein, September 20.

At Chanute Field, Rantoul, Ill.: Chemotherapy—Present Status, Drs. W. Barry Wood Jr. and Italo F. Volini, September 20.

HEALTH NEWS FROM EUROPE

According to DNB of May 13, 1944 (Germany) hospitals have time and again been the target of enemy terror bombers. Far sighted vision revealed many years ago the need for sick persons to be lodged outside towns, in a place where they would be safe from air attacks. Prof. Dr. Brandt, the führer's general commissioner for the medical and health services, was entrusted by the führer with the task of devising and applying the necessary measures. Under the technical direction of Dr. Poschmann, delegate of the general commissioner for hospital emergency installations and of Ministerial-Direktor Schönleben of the building office in the Speer ministry, emergency hospitals were built in several stages at many places all over the reich. Although they are in the nature of emergency hospitals they combine all the qualities of an up to date hospital building with the added advantage of being close to nature, which is particularly beneficial to the sick and also affords protection from air attacks.

Reich Minister Speer gave press representatives an opportunity to inspect such a hospital which is under construction in the neighborhood of the reich capital. The friendly and airy rooms with their white ceilings make one oblivious of the fact that they are really huts. In planning the site the "pavilion" system was abandoned and the six wards form a close structure; they are connected by a 250 meter brick corridor, which makes it possible to move within the hospital, regardless of temperature and weather, exactly as in the several floor building of the town hospital. Each ward consists of several fair sized sickrooms with 6 to 8 beds each, while the smaller sickrooms, wash rooms and bath rooms and a cory common room are situated on the other side of the passage. In each ward there is room for the offices of the doctors and sisters and a kitchenette on the other side of the main connecting corridor. A modern central kitchen for the whole hospital is situated at one end of this corridor, while at the other end is the ward for infectious diseases, which is completely isolated from the other wards and in its design is probably the most up to date of its kind in Europe. Situated between the wards exactly in the center of the whole site is the reception and treatment hut, which also houses the x-ray units and the laboratory and contains the consulting rooms of the dentist, the ophthalmologist and other specialists.

Many such hospitals were completed in the neighborhood of many air raid danger towns during the last four months; despite wartime difficulties it was possible to complete the buildings in the short space of six to eight months. Each hospital has 500 beds and in an emergency will hold as many as 800. Germany disposes already of 15,000 such beds, while space is being provided for thousands more. New methods are also being employed in the administration of these emergency hospitals. They are under the direction of General Commissioner Dr. Brandt, to whom the senior house surgeon is responsible in all matters. This procedure eliminates red tape, particularly in questions of hospital supplies and also in the admission of patients; they are treated there regardless of who is to pay.

These hospitals will naturally be used in the first place to house serious cases and others which it will take some time to cure, while the hospitals in the towns will continue to be available for day to day cases.

The Netherlands Information Bureau states that a group of prominent physicians recruited from American medical schools and hospitals will leave for the Netherlands after that country's liberation to give a series of four week postgraduate refresher courses in Dutch universities. This plan was announced by Dr. Herbert Loeb of Cambridge, Mass., former president of the Netherlands Dental Association at Amsterdam, who was instrumental in arranging for a similar postwar movement to bring dental care to the Netherlands. Nine medical specialists will make the transatlantic voyage to give the refresher courses, which cover eight specialties and have been prepared in both the English and the Dutch languages. The Netherlands government will finance the traveling and other personal expenses of the American professors, who will, however, receive no extra or special compensation for their work in the Netherlands. Because of German looting of Dutch medical schools and hospital equipment, the physicians will take with them all material and instruments needed for laboratory and demonstration purposes.

The idea of these refresher courses originated with Dr. Herman deJong of Duke University, formerly of the University of Amsterdam, where he specialized in neurology and psychiatry for the Dutch branch of the Rockefeller Foundation. He discussed his plan with Dr. Gerrit Bolkestein, Netherlands minister of education, when the latter toured a number of American universities last May, who approved the plan. In addition to Dr. deJong, the expedition will include Dr. Frederick M. Hanes, clinical medicine; Dr. Keith S. Grimson, surgery; Dr. David T. Smith, bacteriology and infectious diseases; Dr. Edwin C. Hamblen, obstetrics, gynecology and hormonology, all of whom are from Duke University School of Medicine, Durham, N. C.; Dr. Wilburt Davison, dean of Duke University School of Medicine, pediatrics. Dr. Isidore Snapper, director of the Department of Graduate Medical Education at Mount Sinai Hospital, New York, will also cover clinical medicine. Dr. Snapper left the University of Amsterdam in 1937 to go to the Rockefeller Foundation at Peiping, China. He was captured by the Japanese and later sent to America as an exchange prisoner. Other members are Dr. C. J. Van Slyke of the Rockefeller Institute, New York, biochemistry, and Dr. Eli K. Marshall Jr., Johns Hopkins University, physiology and pharmacology.

According to *Le journal* of May 18, diets for sick people are granted only on production of a medical certificate drawn up on a printed and numbered form delivered monthly for three periods of ten days. The control is severer as regards No. 1 and feeding up diets, which are granted with the greatest parsimony for only five, seven and sometimes ten days. Each doctor now receives, through the medical council, five printed forms per thousand inhabitants of his district. Thus a skin or eye specialist is entitled to prescribe the same number of diets as a child specialist, whose patients need most feeding up. The results of this measure were that in one Lyons arrondissement the number of persons entitled to diet No. 2 fell within a month in the proportion of four to one. Under diet No. 2 the meat, cheese and wine rations can be replaced by 0.25 liter of milk daily and 750 Gm. of spaghetti, 750 Gm. of sugar and 6 Kg. of potatoes monthly. Those entitled to this diet are generally old persons unable to eat the present meat, and for whom doctor's fees are often an extravagant expenditure which they cannot afford to repeat monthly, preferring to give up the diet. It is incomprehensible that certain patients cannot be treated because the doctor has used his five diet vouchers. Thus the district doctor is often compelled to deprive of their diet those who need it most.

According to *Der Bund*, Berne, of June 28 it is not known whether the decision of the French medical council whereby no doctor may leave the Paris region without the permission of the council is connected with the communiqué extending the compulsory labor service to doctors, or whether it is merely intended to prevent the regrettable situation which arose in the summer

of 1940 owing to the mass flight of doctors. The council's circular adds information about the difficulties facing the medical profession owing to the restrictions on electricity and gas in the Paris district. X-rays can no longer be used either in hospitals or in private consulting rooms. It is almost impossible to sterilize instruments. The modest supplementary distribution of methylated spirit is inadequate.

DNB of May 15, 1944 (Germany) states that the penal regulations on professional abortion have been tightened up by the order for the protection of marriage, family and motherhood. The penal code now provides for the death sentence in cases in which the vitality of the German people has been impaired by continuous abortion. The special court at Frankfurt on the Oder applied this new provision of the law against Heinrich Schulz of Balkow, Kreis West-Sternberg. Schulz had carried out altogether nine abortions and thus committed a particularly grave sin against the future of his people. He was sentenced to death as a dangerous habitual criminal for professional abortion. The sentence has already been carried out.

The DAF announced that five hundred theater performances and lectures were held for Dutch workers in Germany in April, according to the German European Service of May 24, 1944. Medical care for foreign workers in Germany has been further improved. Three hospitals in central Germany have been opened exclusively for their use equipped with the most modern installations, special departments for infectious diseases and clinics for women. Doctors and nursing staff are recruited from Germany and many European countries.

SNP (Norway) reports, according to *Aftontidningen*, Stockholm, of June 21 that a number of young Oslo girls were recently conscripted for "national labor service" in German military hospitals in Oslo and the surrounding districts. The Norwegian home front boycott of conscription included such conscriptions, and if the German authorities continue to summon Norwegian girls, then the girls may find themselves in the same situation as men conscripts.

The Chambery medical board, considering the prohibition of night automobile traffic, the substantial fuel reduction and telephone restrictions, earnestly asks patients to abstain from calling doctors at night, since it is virtually impossible to travel after 10 p. m., according to *Le Nouvelliste de Lyon* of June 17. The most distant patients can be visited only in daylight by taxi.

Transocean (for the Far East) of May 12, 1944 (Germany) states that the first bomb proof dispensary has been opened in a Ruhr town. Built into a steep slope, it is 13 meters long but only 3 meters wide and 2.8 meters high. Ten cupboards contain 5,000 types of drugs and medical supplies, sufficient to meet four weeks' requirements.

Radio Paris of May 22 reports from Brussels that during the night of May 19 a large quantity of anesthetic drugs was stolen by unknown persons from a depot of pharmaceutical products, including a large quantity of crude morphine destined for hospitals and clinics. The stolen goods are valued at about 2 million francs.

The minister of the interior, according to *Slovo* of March 3, 1944, has signed an order published in the Official Gazette of March 24 stating that the fees paid in private hospitals and sanatoriums in the country are increased by 100 per cent over what they were in 1936.

The Mulhauser *Tagblatt* for April 20 (Alsace) states that by a decree dated March 4 (published in the *Verordnungsblatt des Chefs der Zivilverwaltung im Elsass* of April 4) the law introduced in the reich on July 14, 1933 for the prevention of hereditary disease in the rising generation is now valid in Alsace.

ORGANIZATION SECTION

WASHINGTON LETTER

(From a Special Correspondent)

Sept. 4, 1944.

Hearings on Blindness and Infantile Paralysis

Sixty per cent of the cases of blindness in this country are unnecessary and could be prevented, Dr. Harry S. Gradle, professor of ophthalmology at the University of Illinois College of Medicine and vice president of the Illinois Society for the Prevention of Blindness, testified here this past week before the Kelley Labor Committee Subcommittee to investigate aid to the physically handicapped. He spoke as a representative of the American Medical Association. Dr. Gradle deplored the fact that there are not sufficient agencies where a newly blinded person can become accustomed to his affliction and get training in new uses of his senses and capabilities. He suggested centers such as those now operated by the Army and Navy for reconditioning men blinded in war. Prevention of blindness, he contended, "is of even greater importance than care for the blind."

Dr. Gradle recommended that state public assistance commissions be assisted in the physical rehabilitation of the blind. "There are enlisted," he said, "6,000 ophthalmologists in the United States, of whom a little over 2,000 have been certified as being ophthalmologists and 2,000 who are doing capable work without certification. The other 2,000 comprising the 6,000 are mostly general practitioners who are doing a small amount of ophthalmology on the side but who are not capable of doing necessary rehabilitation work." He explained later that "the number we have is sufficient for the physical rehabilitation of the blind. The 6,000 in existence are not enough to cover the needs of the general population of the United States, apart from rehabilitation."

Dr. Gradle was followed as a witness by Dr. Allan C. Wood, director of the Department of Ophthalmology in Johns Hopkins University School of Medicine and director of the Wilmer Ophthalmological Institute, who expressed the opinion that the Sanders 1934 estimate of 150 blind persons per hundred thousand, or from 215,000 to 240,000 blind in the United States, was most accurate of all estimates and "a fair guess." He quoted National Health Survey figures on the incidence of blindness in the 100,000 of population, as follows: "You will find that 11 per hundred thousand of the population are blind under 15, and that figure steadily goes up, so that for the ages between 45 and 54 you find that 90 per hundred thousand are blind, and when you get to 75 to 84 you find that approximately 1,000 per hundred thousand are blind, and when you get to 85 plus, prac-

tically 3,000 per hundred thousand of the population are blind. The answer to that is that the people are moving in their advancing age to the time when the various diseases take their toll of blindness."

These two witnesses were among a score or more heard by Representative Augustine B. Kelley (Democrat, Pennsylvania) in the study on blindness. During the present week it is proposed to hear experts testify regarding the prevalence of infantile paralysis to determine if adequate facilities are available for its treatment. The purpose of the hearings, according to Representative Kelley, is to "learn the causes of the handicaps and the means to cure or alleviate them, to provide the afflicted with educational opportunities, training and restoration to gainful occupations, and to assist those who cannot be employed."

Postwar Hospitalization Under Study

Favorable indications for the bill providing federal aid to build a cooperative hospital center in Washington, to be operated on a self-sustaining and nonprofit basis, have stirred interest here generally in United States postwar hospitalization needs. Senator Millard Tydings (Democrat, Maryland), one of the chief sponsors of the bill, has expressed the conviction that Congress would approve the plan, in which participating hospitals here would pool their resources to carry the full load of maintenance costs. He emphasized that Congress was not expected to contribute anything toward the annual expenses.

The pending plan calls for construction of a 1,500 bed hospital center in which any of Washington's private hospitals could join as participating or associate members. The cost is estimated at between \$6,000,000 and \$7,500,000 exclusive of land. To date only Garfield and Emergency hospitals have decided to join the center as full participating members.

Health authorities here have shown interest in what has been done by the Cleveland Hospital Service Association to help people meet the cost of illness without leaning on the government for funds or control. Eight hundred thousand people in the greater Cleveland area are entitled to benefits, with 55 per cent of all the residents of the community enrolled in the service and currently adding 100,000 additional subscribers annually. Each subscriber to the association makes a small monthly payment, which insures him or a member of his family of proper hospital care when necessary. In its ten years of existence the association has provided such care for 300,000 patients. The Cleveland Hospital Service Association, one of the pioneer organizations of its kind, provides hospitalization only and does not include services of the physician or surgeon. It is one of seventy-eight such associations operating in the United States, details of operations differing in various communities.

MEDICAL ECONOMIC ABSTRACTS

CALIFORNIA PHYSICIANS' SERVICE

A REPORT BY THE BUREAU OF MEDICAL ECONOMICS

The California Physicians' Service has just issued its fifth annual report, so comprehensive as to various phases of the operation of the plan as to form an excellent guide to other state and local medical associations considering the establishment of a prepayment plan. As the first statewide plan, California has been forced to experiment in many directions. It has issued several types of contracts. It still retains a number of these as suited to special conditions. Its largest enrolment is now under the surgical service contract, in which membership dues per month are \$0.60 for male employees, \$0.90 for female employees, \$1.50 for an additional dependent and \$2.25 for two dependents. Participation is limited to those with incomes under \$3,000 a year, to whom all contracted services are granted.

Employed beneficiary members under the surgical contract may obtain a "two visit deductible medical rider." With a few

exceptions this covers a complete medical service for the payment of 75 cents a month in addition to the regular surgical contract rate. To meet the demand for those with an income of more than \$3,000 an indemnity surgical reimbursement contract is issued under which patients make their own arrangements with physicians and receive reimbursement under the regular schedule of the surgical contract.

In northern California territories California Physicians' Service has found it necessary to cover hospitalization as well as surgical services. The hospital rider rates per month are 75 cents for the employed man, 80 cents for the employed woman and \$1.80 and \$2.40 for one and two or more dependents respectively.

Service is also furnished for farm families with an income of less than \$2,000 a year. This program, conducted in cooperation with the Farm Security Administration, provides for medical, surgical and hospital care to all members of the family alike. A fee of \$1.50 must be paid by the patient for the first home visit, and there are some other minor limitations. The rates annually are \$30 for single persons, \$48 for a family of two and \$60 for a family of three or more.

As a special war emergency undertaking, the California Physicians' Service entered into contracts to provide medical, surgical and hospital care to residents of projects under the jurisdiction of local housing authorities. Monthly rates were \$2.50 for single persons, \$4 for a family of two and \$5 for larger families.

The experience with the Rural and Housing Project contracts has gained a necessary knowledge of methods of cooperation with government bodies as well as of the variations in service required under these different conditions. At present California Physicians' Service is paying 90 per cent of what might be called the normal unit value. At one time in 1940 the amount paid per unit was \$1.10 and in February 1944 it was \$2.25. In the meantime the "unit state fund" has been increased to \$70,000. It is hoped that this backlog will avoid such violent fluctuations

in the future. While fairly good relations have been established with such diverse bodies as labor organizations, membership served, hospitals and government agencies, the relations with the medical profession, etc., still remains "the most urgent problem of C. P. S. . . . Without an active and positive support from its professional members, C. P. S. cannot grow, and if it cannot grow it will never reach its true value to the medical profession. C. P. S. is an agency composed of its professional members. It must, regardless of the personal desires of individuals, function as the bulk of its members wish. It cannot perform its purposes in any other manner. . . .

Many of the problems of acquisition are directly related to the lack of professional member support and the lack of labor and employer support.

DISCUSSIONS ON POSTWAR SECURITY

National Health Plan Advocated by Dr. Parran

The United Press reports that a postwar national health program, supported by insurance and taxation, was proposed by Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, in a Labor Day address at the University of California medical center, San Francisco. He suggested that the program should not be "entirely socialized or an entirely private undertaking but a combination of both."

Health Plan Offered to Workers in East

According to the United Press, incorporation papers for a health insurance plan covering all persons living or working in New York and earning not more than \$5,000 annually have been filed with the state board of social welfare and the superintendent of insurance. The plan, providing medical and surgical care, is expected to be ready for operation by January 1, with most of the city's 190,000 employees and many union members enrolled, Mayor F. H. LaGuardia announced. Incorporators include Henry J. Kaiser, West Coast shipbuilder; former Governor Alfred E. Smith, and Beardsley Ruml, chairman of the board of the Federal Reserve Bank; Gerard Swope, chairman of the board of the General Electric Company, Sidney

Hillman, president of the Amalgamated Clothing Workers Union; Wendell Willkie, and the borough presidents.

Eric Johnston Speaks

According to the Chicago *Tribune*, high praise for America's private security system of insurance as compared with any "incentive stifling bureaucracy" contemplated in a postwar super-federal social security system was given by Eric Johnston, president of the Chamber of Commerce of the United States, in an article which will appear in the forthcoming issue of the *Casualty and Surety Journal*. "The private security system of insurance is as American as apple pie," Johnston wrote, "for it was conceived and developed in the adventurous American spirit of individual initiative and enterprise. No sprawling, incentive stifling bureaucracy is this dynamic system, but a nationwide industry, composed of 524,000 self-reliant employees and producers earning their own way in the world, keeping in step with the pulsating tempo of progress." Johnston said that, through private enterprise, a supersocial security system is already here and questioned "the need of elaborate blueprints for a superfederal social security system."

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—The Kelley subcommittee of the House Committee on Labor has scheduled hearings for September 12, 13 and 14, at which time testimony will be received relating to the aid given to the hard of hearing and the deaf. H. R. 1506 has passed the House and Senate, and Senate amendments have been agreed to by the House, proposing to amend further the Pay Readjustment Act of 1942. This bill, among other things, will permit the counting of services in the Medical Reserve Corps for pay purposes. H. R. 5257 has been reported to the House, a bill to provide for health programs for government employees, with an amendment exempting the Tennessee Valley Authority from the scope of the bill. Health services now provided by any governmental agency will continue until June 30, 1945, at which time the Civil Service Commission in consultation with the United States Public Health Service will supervise such health activities.

Bills Introduced.—S. J. Res. 147, introduced by Senator Langer, North Dakota, would authorize an appropriation of \$10,000,000 for the investigation and study of the origin, causes and means of control of infantile paralysis. This resolution proposes to create an Infantile Paralysis Control Board to be composed of the Surgeon General of the Public Health Service as chairman and one outstanding member of the medical profession in each state and in the District of Columbia to be appointed by the Surgeon General. The Surgeon General will also be authorized to "appoint Sister Kenny, the famed Australian nurse, as a member of the board." H. J. Res 305, introduced by Representative Priest, Tennessee, would authorize the Surgeon General of the United States Public Health Service to dispose of certain reserves of liquid, frozen or dry blood plasma or serum albumin to federal, state or local public health authori-

ties or to federal or other nonprofit hospitals. This plasma or albumin is being held in reserve for casualties resulting from enemy action and disposition is to be made of it when the Surgeon General determines that it is no longer needed for the purpose for which it is held in reserve. H. R. 5249, introduced by Representative Rankin, Mississippi, contemplates an amendment to title II of the G. I. Bill of Rights, relating to the education and training of returning veterans, to provide that if any publicly supported institution or private institution exempt from tax under section 101(6) of the Internal Revenue Code has no established tuition fee, or if the established tuition fee is less than the actual cost to such institution of furnishing the education and training, the Administrator of Veterans' Affairs will be authorized to provide for the payment to such institution of the actual cost of furnishing education or training to a veteran, but not to exceed \$500 for an ordinary school year.

DISTRICT OF COLUMBIA

Bills Introduced.—S. 2074, introduced by Senator Tydings, Maryland, for himself and Senator Bilbo, Mississippi, and H. R. 5183, introduced by Representative Harless of Arizona, propose to provide for the establishment of a modern, adequate and efficient hospital center in the District of Columbia. A subcommittee of the Senate Committee on the District of Columbia has conducted hearings on S. 2074. It is understood that the Medical Society of the District of Columbia has approved the bill in principle on condition that all nonprofit voluntary hospitals affording service to indigents and near indigents in the District be given equal opportunity to participate in the program and on condition that they be assured equal representation in the corporate body created by the bill, namely the Washington Hospital Corporation.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Symposium on Penicillin.—The San Francisco County Medical Society devoted its August 8 meeting to a symposium on penicillin at which the following participated:

Dr. Lowell A. Rantz, The Background of Penicillin Therapy.
Dr. Arthur L. Bloomfield, Special Problems in the Clinical Uses of Penicillin.
Drs. Horace J. McCorkle and Henry L. Silvani, Uses of Penicillin in Surgical Infections.
Comdr. Clark M. Johnson (MC), Uses of Penicillin in Infections of the Genitourinary Tract.

Course on Occupational Dermatoses.—Dr. Louis Schwartz, medical director of the dermatoses section of the U. S. Public Health Service, will conduct a course on occupational dermatoses at the Los Angeles County Medical Association, Los Angeles, September 18-23, under the auspices of the University of Southern California School of Medicine and the College of Medical Evangelists, the Los Angeles Chamber of Commerce and the Los Angeles County Medical Association.

Physician Wanted.—The Los Angeles County Civil Service Commission announces that a chief physician (tuberculosis) is wanted to administer the tuberculosis service of the Los Angeles County Hospital or to assist in directing medical care and treatment of patients at Olive View Sanatorium and to act as tuberculosis consultant. Physicians under 55 years of age who have an M.D. degree and three years' recent experience or training in the specialty of tuberculosis are urged to apply for this position, which carries a salary of from \$417 to \$489 a month. Full information and applications may be obtained from the office of the commission, Room 102 Hall of Records, Los Angeles 12. Applications must be filed on or before September 16.

DELAWARE

Committee for Postwar Planning.—The state medical society has appointed a committee of nine to be known as the Committee of Postwar Planning of the Medical Society of Delaware, composed of the following members: Drs. Richard C. Beebe, Lewes; Joseph B. Waples Jr., Georgetown; John Roscoe Elliott, Laurel, representing Sussex County; Joseph S. McDaniel, Dover; William Marshall Jr., Milford, representing Kent County; William O. LaMotte, William Edwin Bird, Frederick A. Hemsath, secretary, all of Birmingham, and Mesrop A. Tarumianz, Farnhurst, chairman, representing New Castle County. A survey of medical and hospital services of all types will be carried out in sections of the state to aid the committee in studying adequate medical services of various specialties for every community of the state, various hospital facilities, medical service to industry, large and small, adequate medical service of all types for public schools, the need for closer relationship between all existing state, municipal and private postwar planning organization and hospitals to enlist the full cooperation of all physicians and hospitals for rehabilitation of veterans. The society, which believes that as a scientific organization it cannot achieve the desirable level of success unless it becomes an integral part of the economic and social structure of the country, will cooperate with the state legislature, state administration, various boards of education, various industrial and agricultural organizations, chambers of commerce, bar association, state and municipal and private, social, civic and religious agencies, all labor unions promulgating the definite policy that sound health is the business of every citizen and the prerogative of progressive people, and that this can be achieved through the help and cooperation of organized medicine.

ILLINOIS

Stuart Wood Memorial Fund.—Plans are under way to establish a memorial fund in honor of the late Dr. Wilbur Stuart Wood, Decatur. The memorial will take the form of a fund to be used to purchase orthopedic equipment in the Decatur and Macon County Hospital, where Dr. Wood had been active for many years. Dr. Wood died August 7.

Chicago

Rongetti Sentenced to County Jail.—Amante Rongetti, whose license to practice medicine was revoked in 1932 when he was sent to the state prison at Joliet following his conviction of manslaughter, was sentenced August 30 to three months in the county jail for practicing medicine without a license and fined \$500. Newspapers reported that the sentence was imposed by Judge Russell W. Keeney of Du Page County sitting in county court. Rongetti is also reported to have served a term in the federal penitentiary at Leavenworth for violating the federal narcotic act. At the trial, June 14, Rongetti was found guilty by a jury after an inspector for the state department of registration and education testified that he had prescribed distilled water for a "supposed kidney ailment." Ray E. Lane, Rongetti's attorney, said he would appeal.

Assembly on Nervous and Mental Diseases and War.—The Institute of Medicine of Chicago will hold its postgraduate assembly, November 1-2, at the Palmer House. The program will cover "Nervous and Mental Diseases and War" and will be devoted to phases of neurology, psychiatry and neurosurgery that are of particular importance to clinicians, specialists and lay workers. There will be a registration fee of \$5 for all except those in uniform. Among the speakers will be:

Dr. Samuel W. Hamilton, Washington, D. C., Psychiatry Before World War II.
Dr. Winfred Overholser, Washington, Civilian Mental Health in War-time.
Dr. C. Charles Burlingame, Hartford, Conn., Present and Future Effects of War Neuroses.
Dr. Bernard J. Alpers, Philadelphia, War and Nervous Disorders.
Dr. Cobb Pilcher, Nashville, Tenn., Civilian Advances and Investigations in Neurosurgery During the War.
Col. William C. Menninger, M. C., The Mentally Unfit: Detection, Elimination and Disposal.
Lieut. Col. Roy R. Grinker, Psychiatric Disorders in Combat Crews Overseas and in Returnees.
Dr. Edwin G. Zabriskie, New York, Nervous Disorders in the Armed Forces.
Capt. Winchell M. Craig, M. C., Injuries to the Central Nervous System.
Dr. Howard C. Naffziger, San Francisco, Injuries to the Peripheral Nervous System.
Luther E. Woodward, Ph.D., New York, Social Readjustment of Returning Veterans.
Lieut. Comdr. Howard P. Rome (MC), The War and Its Psychiatric Problems.
Dr. David J. Margolis, Chicago, Compensation Laws and the Veterans Administration.
Dr. Sidney I. Schwab, St. Louis, Residuals of Neuropsychiatric Disorders.
Dr. Ernest Sachs, St. Louis, Residuals of Neurosurgical Disorders.

The program will include a series of panel discussions on war neuroses or battle fatigue? war injuries to the nervous system, does war modify the behavior of the civilian population? and who are the mentally unfit for military service? The first evening session will include a neuropsychiatric "information phase" program with Dr. Foster Kennedy, New York, as moderator. On the second evening Dr. Edward A. Strecker, Philadelphia, will deliver the seventeenth annual Pasteur lecture of the institute on "War Psychiatry and Its Influence on Post-war Psychiatry and Civilization."

KANSAS

Jack Austin Dies.—Capt. Jack F. Austin, executive secretary of the Sedgwick County Medical Society from 1937 until 1942, when he went into military service, was killed recently while on maneuvers in South Carolina, according to the *Medical Bulletin* of the Sedgwick County Medical Society.

William Abramson Named Supervising Ophthalmologist.—Dr. William F. Abramson, Topeka, has been appointed state supervising ophthalmologist for the division of service for the blind of the Kansas State Board of Social Welfare, succeeding Dr. William W. Reed, Topeka. The appointment is effective for an eighteen month period.

MASSACHUSETTS

Advisory Committee for Endorsement of Heavy Cream.—In Massachusetts authority has been given to the district supervisor of the Office of Distribution to make a reasonable interpretation of the terms of amendment 2 to War Food Order number 13, emanating from the Office of Distribution of the War Food Administration, providing that medicinal prescriptions for heavy cream must be approved by the public health officer or the secretary of the county medical society of the area where a patient or hospital is situated. The *New England Journal of Medicine* reports that the endorsing function has, by this interpretation, been vested in an advisory committee composed of John H. Sullivan, district

supervisor, Office of Distribution, War Food Administration, chairman; Dr. Vlado A. Getting, Boston, state commissioner of health; Dr. G. Lynde Gately, Boston, city health commissioner; Dr. H. Quimby Gallupe, Boston, secretary, state board of registration in medicine; Dr. Nathaniel W. Faxon, medical director, Massachusetts General Hospital, Boston, and Drs. Francis Gorham Brigham, Brookline; Joseph Garland, Boston; Loring Grimes, Swampscott, and Franklin W. White, Boston, representing the Massachusetts Medical Society.

MICHIGAN

Seminar on Speech Rehabilitation.—The speech clinic of the University of Michigan, Ann Arbor, announces an intensive training course for veterans with speech and hearing disabilities. The course will begin November 6 and continue for six weeks. This program will be similar to one mentioned in *THE JOURNAL*, June 17, page 504.

Personal.—Melville Sahyun, Ph.D., has been named divisional vice president of Frederick Stearns and Company, Detroit, Division of Sterling Drug, Inc. Dr. Sahyun has been associated with Stearns since 1934, first as director of biochemical research and since 1943 as director of research. He developed the first amino acid preparation for parenteral administration in man and his book "An Outline of the Amino Acids and Proteins" will soon be published.

Fredrick Yonkman Joins Ciba Company.—Dr. Fredrick F. Yonkman has resigned as professor of pharmacology and therapeutics and chairman of the department at Wayne University College of Medicine, Detroit, to accept a position as chief pharmacologist in the research division of Ciba Pharmaceuticals, Inc., of Summit, N. J. Other changes in the pharmacology staff include the resignation of Dr. Harold F. Chase, assistant professor, to accept a similar position in the Western Reserve University School of Medicine, Cleveland, and Bradford N. Craver, Ph.D., as research associate to become instructor and director of pharmacologic research conducted under governmental contract at the University of Rochester, N. Y.

NEW JERSEY

Personal.—Dr. Jacob Cohen, formerly acting clinical director of Central Islip State Hospital, Central Islip, N. Y., has been appointed assistant director of the Newark State School, Newark. Since the death of Dr. August E. Witzel, May 15, Dr. Hiram G. Hubbell, assistant director (superintendent), has been acting director.

Foremen Should Not Dispense Acetylsalicylic Acid.—Newspapers reported on August 12 that Dr. J. Lynn Mahaffey, Trenton, state director of health, made a recommendation to the Ford Motor Company at Edgewater that it discontinue a recently established practice of allowing foremen to dispense aspirin (acetylsalicylic acid) to workers complaining of minor ailments. It was stated that the health director also recommended that the company revert to its old procedure of allowing workers complaining of minor ailments to visit the company's time, first aid stations in the plant staffed with medical personnel.

Medical School to Open October 1.—The Essex College of Medicine, said to be the first institution of its kind in New Jersey, plans to open about October 1 in a three story building at Broad Street and Third Avenue, Newark, according to the *New York Times*. The facilities include an auditorium, twenty-five classrooms and laboratories. A prospective faculty of fifty members is available, it was stated. The state board of education recently ruled that the school might not issue the degree of doctor of medicine until it has been in existence two years. In a statement to the press, Samuel R. Herbst, registrar, is reported to have said "The board encouraged us to open on that basis. It's a testing period, a trial period that they wanted us to go through, and we'll open on that understanding." The registrar also stated that more than 200 applications, mainly from New Jersey residents, had been received, and that the institution would open as soon as 100 had been accepted. For the first four years only 100 students would be accepted each year, it was stated.

NEW YORK

Personal.—A surprise party was held for Dr. Christopher G. Parnall recently in celebration of his twentieth anniversary as medical director of the Rochester General Hospital, Rochester.

Physician Observes Ninety-Fifth Birthday.—Dr. Gerrit F. Blauvelt, Nyack, former president of the Rockland County Medical Society, observed his ninety-fifth birthday August 1. Dr. Blauvelt is the sole surviving incorporator of the Nyack Hospital.

Free X-Ray Service to Public.—The Ontario County Committee on Tuberculosis and Public Health plans to make available free roentgenograms of the chest to every one, newspapers reported. The plan is an expansion of the original one of limiting the service to industrial employees only. Tests will be made by a visiting mobile x-ray unit that will tour the county and will be available to any one wishing to do so.

Physicians Honored.—Dr. Festus M. Chaffee was given a dinner in the Middlesex Town Hall, August 1, for his forty years of service to the community.—The Wayne County Medical Society on August 8 gave a dinner in honor of four members who have completed fifty years in the practice of medicine. The physicians are Drs. George D. Winchell, Rose; Cyrus P. Jennings, Macedon; Samuel L. Houston, Wolcott, and Ralph Sheldon, Lyons.

Outbreak of Food Poisoning.—Ninety-two members of the staff at Strong Memorial Hospital, Rochester, became ill, August 17. Fifty-two were hospitalized and 40 others were unable to report for duty. An investigation disclosed that the outbreak was attributed to bacteria infected egg salad sandwiches which had been served to members of the staff. None had been served to the patients of the hospital. Among the persons ill were medical students, physicians and dietitians. The 40 less severe cases were among student nurses, who were treated at their homes, the *Rochester Times-Union* reported.

New York City

Louis Julianelle Dies.—Louis A. Julianelle, Ph.D., chief of the division of infectious diseases, Public Health Research Institute, died in Memorial Hospital for the Treatment of Cancer and Allied Diseases, August 12, aged 49. Dr. Julianelle received his Ph.D. at the University of Pennsylvania in 1922, subsequently serving there as instructor in bacteriology. After a number of years of service at the Hospital of the Rockefeller Institute, Dr. Julianelle joined the staff of Washington University School of Medicine, St. Louis, serving there from 1930 to 1942, when he went to New York.

The Lewis Cass Ledyard Fellowship.—Applications are now being accepted for the Lewis Cass Ledyard Jr. Fellowship by the Society of the New York Hospital. Three thousand dollars will be available as a stipend to an investigator in the fields of medicine and surgery or in any closely related field and about \$1,000 for supplies or expenses of the research. Preference will be given to younger applicants who are graduates in medicine and who have demonstrated fitness to carry on original research of high order. Applications should be received by the Committee of the Lewis Cass Ledyard Jr. Fellowship not later than December 15. It is expected that the award will be made by March 15, 1945. Additional information may be obtained from Dr. Eugene F. Du Bois, chairman of the committee, Society of the New York Hospital, 525 East 68th Street. The fellowship was established in 1939 by a gift from Mrs. Ruth E. Ledyard in memory of her late husband, Lewis Cass Ledyard Jr., a governor of the New York Hospital.

Course in Industrial Medicine.—The Long Island College of Medicine, Brooklyn, will conduct its third postgraduate course in industrial medicine October 16 to November 3 under the auspices of the department of preventive medicine and community health. The course intends to provide physicians engaged in full time or part time industrial practice, as well as those who wish to enter this field an opportunity to orientate themselves more fully to modern procedures in the rapidly developing specialty of industrial medicine. This year the course will place particular emphasis on postwar conditions and problems associated with the return of workers from military service. Although designed for graduate physicians, the course will be open to industrial executives, personnel workers, industrial nurses, hygienists, engineers and others interested in industrial health. The course will include afternoon and evening lectures and seminars at the college supplemented by morning clinics and demonstrations arranged in cooperating hospitals and industrial medical departments. Sections of the course will be devoted to medical administration in industry, industrial aspects of internal medicine, industrial surgery, occupational diseases and personal relations in industry, with emphasis on the medical aspects of personnel problems. Additional information may be obtained from Dr. Thomas D. Dublin, 248 Baltic Street, Brooklyn 2.

OKLAHOMA

Narcotic Violation.—Dr. William T. Huddleston, Konawa, pleaded guilty in the U. S. District Court at Muskogee, June 28, of a violation of the federal narcotic laws. The physician was sentenced to pay a fine of \$800 and was placed on probation for a period of five years.

The Leroy Long Memorial Lecture.—Dr. George M. Curtis, Columbus, Ohio, gave the Leroy Long Memorial Lecture in Oklahoma City, June 21, on "Surgery of the Spleen." The lecture is sponsored by the alumni and undergraduates of Phi Beta Pi as a memorial to the late Dr. Leroy Long, Oklahoma City, dean of the medical school from 1915 to 1931.

Annual Conference.—The Oklahoma City Clinical Society will hold its fourteenth annual clinical conference at the Biltmore Hotel, Oklahoma City, October 23-26. Among the speakers will be:

Dr. Nathaniel G. Alcock, Iowa City, urology.
Dr. O. Theron Clagett, Rochester, Minn., surgery.
Dr. Charles C. Denme, Kansas City, Mo., dermatology.
Dr. Lawrence P. Engel, Kansas City, surgery.
Dr. George P. Guibor, Chicago, ophthalmology.
Dr. Tinsley R. Harrison, Dallas, Texas, medicine.
Dr. Harold G. Jones, Chicago, gynecology.
Dr. Ralph A. Kinsella, St. Louis, medicine.
Dr. Hugh McCulloch, St. Louis, pediatrics.
Dr. Ralph H. Major, Kansas City, medicine.
Dr. William F. Mengert, Dallas, obstetrics.
Dr. Alan R. Moritz, Boston, pathology.
Dr. Henry H. Ritter, New York, surgery.
Dr. George E. Shambaugh, Chicago, otolaryngology.
Dr. James S. Sneed, Memphis, Tenn., orthopedic surgery.
Dr. Bruce K. Wiseman, Columbus, Ohio, medicine.
Dr. Herman L. Kretschmer, Chicago, President, American Medical Association.

PENNSYLVANIA

Foreign Nonprofit Organizations and Medical Service.—The Department of Justice of Pennsylvania has ruled that foreign nonprofit corporations cannot enter the state to provide or render medical services to individuals except when specifically authorized by statute, according to *Philadelphia Medicine*.

Schireson Obtains Injunction Against State Board.—A temporary injunction was recently issued by the Dauphin County Court restraining the state board of medical education and licensure from conducting a hearing on a citation against Dr. Henry J. Schireson, Philadelphia, to show cause why his license should not be revoked. The hearing was to have been held July 14.

RHODE ISLAND

Personal.—Paul J. Spencer of Butler Hospital, Providence, has been appointed secretary of the New England Hospital Assembly to succeed Gerhard Hartman, director of Newton Hospital, Newton, Mass., resigned.

Butler Hospital Observes Centennial.—Butler Hospital, Providence, will hold its second and final observance of its one hundredth anniversary on October 4. The program is intended to interest the lay public, and a special evening session will be held at the Rhode Island School of Design. Governor J. Howard McGrath is expected to attend the meeting. Other speakers will include:

Dr. Elihu S. Wing, Providence, president, state medical society, a message from the medical profession.
Clemens J. France, director, Rhode Island State Department of Social Welfare, an appreciation from social welfare.
Col. H. Edmund Bullis, A Hundred Years of Service in Mental Health.
Dr. Arthur H. Ruggles, superintendent, Providence, A Few Remarks on the Past, the Present and the Future of Rhode Island's Oldest Hospital.

GENERAL

Physician Needed in West Africa.—Dr. George W. Harley, who recently returned to this country because of an emergency health condition, announces that a physician is urgently needed in Ganta, Liberia, West Africa. The emergency was created when Dr. Harley, founder of the Ganta Mission, was compelled to return to the United States. The area to be served is inhabited by more than a million natives and 25 or 30 white missionaries. Physicians in contingent mission stations have gone one by one to join the United States armed forces. At the dispensary handled by Dr. Harley the work is now carried on with the aid of a school teacher, Miss Mildred Black, who is not even a nurse, and a couple of schoolboys who help in the treatment of about 200 patients with leprosy and assist with intramuscular and intravenous injections each week. These injections are mostly for yaws, trypanosomiasis, schistosomiasis and other skin diseases. The position is available to a doctor of medicine who has graduated at an approved medical school and who has had two years' internship or residency. The salary is moderate, with allow-

ances for wife and children; travel expenses will be paid. Communication from Dr. Harley indicates that the position offers experience in tropical medicine and includes facilities for research in trypanosomiasis and leprosy.

Accident Facts.—The National Safety Council has just brought out its 1944 edition of "Accident Facts," which presents a comprehensive report on accidents of all types. The booklet states that the 1943 accidental death toll was 97,500, an increase of about 2 per cent over 1942. Accidental injuries in 1943 totaled about 10,100,000, about 350,000 of which resulted in some permanent disability ranging from a finger amputation to permanent crippling. Accident costs totaled approximately \$4,900,000,000, including wage loss, medical expense, overhead costs of insurance, property damage in motor vehicle accidents and fires, and the so-called indirect costs of occupational accidents. Motor vehicle accidents accounted for 23,400, a 17 per cent decrease from 1942. Public nonmotor vehicle accidental deaths of civilians totaled 17,000, a 6 per cent increase over the previous year. There were 32,500 civilian home accident fatalities in 1943, an increase of 7 per cent over 1942. Deaths of civilians in occupational accidents totaled 18,000, or 3 per cent less than in 1942. Accidental deaths of military personnel in the United States accounted for 11,500 deaths, a 69 per cent increase over 1942. The most important single type of accidental death in 1943 was falls, replacing motor vehicle accidents, which had for twenty years resulted in the largest annual death total. Falls accounted for 27,400 deaths, giving a rate per hundred thousand of 20.3, an increase of 7 per cent over 1942. The total increase since 1933 amounted to 17 per cent.

American Hospital Meeting.—The annual convention of the American Hospital Association will be held at the Hotel Statler and Public Auditorium, Cleveland, October 2-6. The preliminary program includes the following speakers:

Thomas S. Gates, LL.D., President, University of Pennsylvania, Philadelphia, The Commission on Hospital Care.
Dr. Arthur C. Bachmeyer, director, University of Chicago Clinics, Hospital Trends.
Dr. Morris Fishbein, Editor, THE JOURNAL, The Physician and Public Health.
Dr. Julius L. Wilson, New Orleans, Tuberculosis, the Hospital and Public Health.
Dr. John R. McGibony, Washington, D. C., Program of the Indian Service Hospitals.
Dr. Edwin Dwight Barnett, Santa Rosa, Calif., Hospital and Public Health Under One Administration.
Dr. Ephraim M. Bluestone, New York, Basic Principles of Medical Social Work.
Dr. Herman G. Weisotten, Syracuse, N. Y., Medical Care of the Discharged Hospital Patient.
Dr. Cassius H. Watson, New York, Trends in Outpatient Service.
Dr. Harold M. Coon, Madison, Wis., Hospitals' and Nurses' Personnel Relations.
Dr. Clarence H. Bellinger, Brooklyn, Organization and Management of Shock Therapy Service.
Dr. Melbourne G. Westmoreland, Council on Medical Education and Hospitals, American Medical Association, Where is the Record Librarian Coming From?
Dr. Victor Johnson, Secretary, Council on Medical Education and Hospitals, American Medical Association, What Should the Returning Doctor Expect from His Hospital?
Col. Richard P. Strong, M. C., Our Hospitals' Problems in Diagnosing and Treating Tropical Diseases.

International College of Surgeons.—The ninth national assembly of the United States chapter of the International College of Surgeons will be held at the Benjamin Franklin Hotel, Philadelphia, October 3-5, under the presidency of Dr. Thomas A. Shallow, who will speak on "Radical Treatment of Carcinoma of the Esophagus." Included among the speakers will be:

Dr. George M. Piercol, Philadelphia, Rehabilitation.
Dr. Desiderio A. Roman, Philadelphia, The Classic Cesarean Section, with Analyses of 53 Cases Operated on by the Author.
Dr. Leonard Averett, Philadelphia, Vaginal Hysterectomy: Indication and Advantages.
Dr. Frances I. Seymour, New York, The Responsibility of the Surgeon in the Preservation of Human Fertility.
Dr. Roy W. Mohler, Philadelphia, An Analysis of the Indications, Results and Dangers of Complete and Supravaginal Hysterectomy.
Dr. Clifford B. Lull, Philadelphia, Caudal Anesthesia.
Dr. Karl F. Schieffeler, Milwaukee, Pentothal Sodium Anesthesia in Major Surgery and Its Dangers.
Dr. Charles M. Griffith, Washington, D. C., The Rehabilitation of Ex-Members of the Armed Forces by the Veterans Administration.
Capt. Howard H. Montgomery (MC), Rehabilitation in the Navy.
Major General George J. Lull, M. C. (Subject not announced).
Vice Admiral Ross T. McIntire, Surgeon General of the Navy (Subject not announced).
Dr. Thomas B. Noble Jr., Indianapolis, The Surgical Control of Obstructive Adhesions of the Small Bowel.
Dr. John E. Cannaday, Charleston, W. Va., The Cutis (Dermis) Graft Transplant.
Dr. Robert H. Ivy, Philadelphia, Principles of Skin Graft.
Dr. Lyman Weeks Crossman, New York, Refrigeration for the Preservation of Traumatized Tissue.
Dr. John Royal Moore, Philadelphia, Massive Bone Defects.
Dr. Cuthbert Lee Hall, Washington, D. C., Osteotomy for the Treatment of Ununited Fractures of the Femoral Neck.

Dr Austin T Moore Columbia S C Fractures of the Hip Joint Treatment with Adjustable Nails or Blade Plate Fixation
Dr Roger Anderson, Seattle (subject not announced)
Drs Harry F Bacon, Orville C Gass and William D Todhunter Philadelphia, Cancer of the Rectum and Pelvic Colon with Special Reference to Preoperative and Postoperative Treatment
Dr William Seaman Bainbridge, New York A Survey of Surgical Results in Cancer
Dr Albert A Berg New York, The Preservation of the Sphincter Ani in Radical Operation for Cancer of the Rectum
Dr Elmer Hess Erie Pa, The Indications for Transplantation of the Ureters with a New Surgical Technique
Dr Oswald Swinney Lowsley, New York, Plastic Operations on the Kidneys
Dr Rudolf Nissen New York A New Technique of Operation for Cysts of the Lung and for Chronic Spontaneous Pneumothorax
Dr Frederick M Allen New York Surgical Shock and Its Treatment
Dr Richard H Lawler, Chicago Gastric Surgery
Dr Sebastian J Carnazzo, Omaha, Subtotal Gastric Resection for Peptic Ulcer
Dr Max Thorek Chicago, History and Practical Application of Tubo-vulvar Gastrostomy
Dr Moses Behrend, Philadelphia Ulcerative Leiomyoma of the Stomach
Dr Asher Winkelstein New York The Relation of Gastric Acidity to Recurrent Ulcers After Partial Gastrectomy
Dr Otto De Muth, Vancouver, B C, Recent Developments of Biliary Surgery
Nicholas A Michels D Sc, Philadelphia Variations in the Arterial Blood Supply of the Liver, Gallbladder, Stomach, Duodenum and Pancreas
Robert Lich Jr and Ralph B Samson U S Public Health Service Reserve, A Method of Inguinal Herniorrhaphy
Miss Helen S Willard director, Philadelphia School of Occupational Therapy, Occupational Therapy in Rehabilitation
Dr William A Lell Philadelphia, Observation on the Bronchoscopic Insufflation of the Sulfonamides into the Tracheobronchial Tree
Dr Benjamin I Golden Elkins, W Va, Massive Single Doses of the Sulfu Drugs
Dr Elias D Lawrence Paterson N J, Sphenous Vein Ligation
Dr Edmund B Spaeth, Philadelphia, Aneurysm of Circle of Willis from an Ophthalmological Standpoint
Dr Samuel R Skillern, Philadelphia, The Frontal Sinuses as the Path way of Infection to the Cranium and Its Contents
Dr Ben Robnett Dysart, Pasadena, Calif, Diabetic Gangrene Involving the Sinuses

The program will include a series of round table discussions and scientific and technical exhibits and motion pictures. On Wednesday evening the convocation address will be delivered by Dr Morris Fishbein, Chicago, Editor of *THE JOURNAL*, on "The Organization of American Medicine." The assembly dinner will be held Thursday evening.

FOREIGN

Dr. Aldo Castellani Reported Suspended from Rome Faculty—Dr Aldo Castellani, who formerly served as professor of tropical medicine at Tulane University of Louisiana School of Medicine and Louisiana State University Medical Center, New Orleans, is reported to be one of twenty five members of the faculty of the University of Rome who have been suspended. According to *Science*, the *Times*, London, states that the majority of these men had either been ministers in the fascist government or had held high appointments in the corporations.

Special Lectures—At the recent sixth annual meeting of the Royal Australasian College of Physicians, Sydney, Australia, a portrait of the first president of the college, Sir Charles Buckerton Blackburn, was unveiled. Special lectures delivered as a part of the meeting included the second G L Renne Memorial Lecture by Sir C Trent Champion de Crespigny, London, on "Torula Infection of the Central Nervous System" and the second Anne B Cuning Lecture by Dr C G McDonald on "Diet and Disease." Other speakers included Lieut Col J Erskine Sewell on "Notes on Scrub Typhus from the Observation of 500 Cases," Dr T M Greenaway, "Hyperinsulinism Due to Pancreatic Adenoma" and Dr S V Sewell, "The Results of Sympathectomy in the Treatment of Severe Cardiac Pain, Headache and So forth."—Dr Thomas L Hardy recently delivered the Croonian Lectures before the Royal College of Physicians of London on "Order and Disorder in the Large Intestine."

Report Dr Carrel Ousted—On August 28 the Associated Press reported that Dr Alexis Carrel, emeritus member of the Rockefeller Institute for Medical Research, New York, and associate member of the American Medical Association, had been dismissed from his position as director of the Vichy government's Foundation for the Study of Human Relations. The information was said to be broadcast over the Paris radio and further intimated that the foundation had been "notorious for its actions detrimental to the French nation." Dr Carrel, who is 71 years of age, is a native Frenchman who retained his citizenship despite many years spent in the United States. A newspaper report on August 30 indicated that Dr Carrel had been arrested by the French Forces of the Interior on charges that he had "founded his institute with Vichy support for the purpose of supplanting the great French universities,

and introducing fascism and Marxism to the students." It was further stated that the Petain regime donated funds freely to Dr Carrel's institute, the initial gift amounting to about \$800,000, with the intention of hiring away professors from the Sorbonne and other universities. It was further alleged that Dr Carrel tried to close university laboratories so that professors would have to come to his institute to earn their living.

Government Services

Charles Williams to Direct States Services

Dr Charles L Williams, who has been stationed in New Orleans as medical and district director for the U S Public Health Service district number 4 since July 1, 1940, was to have been transferred on August 16 to Washington, D C, as assistant surgeon general. He will be in charge of the Bureau of States Services (*THE JOURNAL*, Dec 11, 1943, p 983) and will be promoted to the rank of brigadier general.

Private Home Given to Public Health Service

Hilhome in Westchester County, New York, estate of the late Percy S Straus, became on August 11 the property of the U S Public Health Service, which will make it a convalescent home for merchant seamen and Coast Guardsmen. The presentation of the deed by Mrs Straus was made in a special ceremony in the headquarters of the U S Public Health Service in Washington, D C. In accepting the deed Dr Thomas Parran, Surgeon General, U S Public Health Service, is reported to have said that the home may be converted into a convalescent home with 75 beds and, subject to Presidential approval, will be the site of a permanent hospital under the postwar program of the public health service. The property includes a 112 acre tract partly in the town of Rye and partly in the town of Harrison and is located 4 miles north of Port Chester. Hilhome will be available for hospital use immediately and will be adapted for permanent hospital service. During the twenty-five years that it has been the home of the Straus family, more than a million dollars has been expended on the property above the original cost. Mr Straus was formerly chairman of the board of R H Macy and Company.

Funds for Public Works

The President, July 10, approved allotment of federal funds totaling \$1,412,488 for thirty war public works and services projects in seventeen states, including hospital and child care facilities and schools in war impacted communities. Major General Philip B Fleming, federal works administrator, announced a grant of \$291,802 will match funds of the Sisters of St Francis for constructing and equipping a 100 bed hospital in Detroit to cost an estimated \$583,604. A second grant in the Detroit area is for \$30,800 for an addition to the Burton School in Royal Oak Township. Federal contributions of \$222,324 and \$199,886 go to the U S Public Health Service for continued assistance in the maintenance and operation of venereal disease hospital facilities in Chatham County and in Augusta, Ga, respectively. More than 2100 patients have been treated in these centers. A grant of \$75,700 was made to the Allegany Hospital of the Sisters of Charity in Cumberland, Md, providing for the dismantling and transporting of a demountable dormitory from Dublin, Va, and constructing, altering and equipping the building to provide training facilities for student nurses. A grant of \$34,500 will match an equal amount provided by the Medical College of Virginia, Richmond, for remodeling a part of St Philip Hospital in Richmond, to expand training facilities for 185 student nurses. Six California communities will receive funds for child care centers and for school maintenance. Other projects were approved in Alabama, Arizona, Idaho, Missouri, Oregon, North and South Carolina, Pennsylvania and Texas.

CORRECTION

Officers of Pathology Board.—The name of Major R Philip Custer, M C, was inadvertently omitted from the news item carrying the names of new officers of the American Board of Pathology (*THE JOURNAL*, August 12, p 1051). Major Custer was chosen trustee-at-large of the board.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 5, 1944.

The Rebuilding of Guy's Hospital

Guy's Hospital is known all over the world not only as a great teaching center but also for the advances in English medicine emanating from it. The clinician Jonathan Hutchinson once said "Diseases seem to have been made in order that Guy's physicians should discover them." No doubt he had in mind the eponymous diseases of Bright, Addison and Hodgkin, who were elder contemporaries of his. This famous hospital has been badly damaged by German bombs, but arrangements have already been made, thanks to the munificence of Lord Nuffield, to restore it with every modern equipment and to build a new college for students. The eighteenth century buildings, which have survived and are suitable for modern requirements, will be combined with new buildings. Now located in the country (whither bombing has made many of the London hospitals resort) is what is known as "Guy's U. S. A. Hospital," because it was started as a wartime measure largely by American help. It is thought that this should prove of great value in working out the bigger plan for a permanent country Guy's. Planning is not restricted to building. A closer fusion of the hospital with its medical and dental schools into a great teaching center is contemplated. Already new fields are opening up. A recent development, the York Clinic for Psychoneuroses, is the only one of the kind in the country associated with a teaching hospital. Guy's has the largest dental school, and it is hoped that arrangements can be made for every patient to receive not only expert dental treatment but also any other treatment necessary. It is also proposed to establish a university chair in dental medicine and to make a study of the relations between dental disease and disease processes in general.

Labeling of Foods to Protect the Public

The Ministry of Food has issued an order on food labeling which is intended to ensure wholesome quality and to make certain that the public gets what it expects. Under the new ruling, certain requirements must be met by the labels of all prepacked foods (those packed or made ready in advance for retail sale in a wrapper or container). The labels must show the name and address or registered trade mark of the person for whom the food is packed and the name or usual name of the food. Foods containing more than one ingredient must show the usual name of the ingredients in the order of the proportions in which they were used and the minimum quantity of food in the package. Foods claiming to contain vitamins or minerals are subject to special rules. Claims must not be made on the labels or in advertisements unless supported by a statement of the nature of the vitamin or mineral present and the quantity. Fruit and vegetables are exempt from this order unless canned or boiled.

The Accidental Discovery of Penicillin

In an address at the King's Chapel of the Savoy on Hospital Sunday (when donations for the hospitals are collected), Alexander Fleming, the discoverer of penicillin, delivered an address. The discovery, he said, illustrated the great value of the freedom to pursue research which was so prominent in the voluntary hospital and might be restricted under a more bureaucratic system. Like many bacteriologists, Professor Fleming related, he had many culture plates contaminated with mold spores which drop from the air, and, like every other bacteriologist, he had cast them out with suitable expressions of annoyance. But on this one occasion he did not, and peni-

cillin was the result. He noticed that the molds prevented growth of the culture for a small area. It seemed providential that the most powerful agent against septic infection was discovered at this time, when we were plunged into a bloody war. Penicillin has already done much to alleviate the sufferings of the wounded, Fleming stated, and will do more as the supply increases. In the last war the infected wounds of many soldiers remained open for six months or more, with frequent painful dressings. Now it is hoped that by the aid of penicillin they will not become infected at all or that, if they do, many will heal in a month or less.

The Site for Intramuscular Injections

In the correspondence columns of the *British Medical Journal* attention is called to the danger of using the gluteal muscles as a site for intramuscular injections. This practice is not only in vogue but is taught in our leading hospitals, it is stated by Prof. Grey Turner, who recalls that he pointed out its dangers as long ago as 1920. After the first world war he observed that several soldiers were victims of severe and persistent neuritis or paralysis of the great sciatic nerve as a result of injecting quinine solutions into the nerve instead of into the mass of the gluteal muscle. A case of death from sloughing also came to his knowledge. After the malaria epidemic in Ceylon there were at least 2 cases of severe secondary hemorrhage from the superior gluteal artery complicating abscess due to injecting quinine into the buttock. In 1941 A. W. Frankland stated in the *Journal* that if solutions of sulfapyridine are administered deeply into the gluteal region there is grave danger of injury to the larger branches of the sciatic nerve. He quoted 6 cases of foot drop with varying degrees of anesthesia, and also cases of gluteal paresis. Recently one of the larger provincial hospitals was forced to pay damages of several hundred pounds because a patient developed sciatic paralysis after an injection in the gluteal region.

Professor Turner again urges that the outer side of the thigh is the proper place for such injections. The vastus externus is a large muscle, is protected by the fascia lata and is not traversed by any important vessels or nerves. The muscular mass is of large capacity and as much as 500 cc. can be introduced into its substance, provided the injection is done slowly. The technic is simple, Professor Turner claims. A point on the middle of the outer side of the thigh is selected, and the hollow needle is thrust at right angles to the surface. It is enough to insert it just beneath the fascia lata—a point which can readily be determined by the sensation of yielding resistance after penetration or by introducing the needle to the average depth of about an inch. If the needle strikes the bone no harm is done, provided it is withdrawn about half an inch before injecting. If necessary, injections of small bulk may be made repeatedly in this situation. It is reasonable to vary the area of injection by starting near the top of the thigh and working down to about 3 inches above the knee; or the outer side of the other thigh may be used alternately. Injection of a particularly irritating solution or introduction of infection may result in abscess, but that is about the worst that can happen. The risk of phlebitis and generalized systemic infection associated with rigors is eliminated, Professor Turner says.

The *Army Medical Department Bulletin* also deals with the subject of intramuscular injection, particularly in battle casualties. The *Bulletin* points out that the injection should be made into healthy muscle. The gluteal muscles are perhaps most often chosen. They are extensive enough to absorb a good volume of fluid. It is important to keep clear of the sciatic nerve and related vessels. The upper and outer quadrant alone may be regarded as a suitable area for injection; it has a good thickness of muscle, lies well away from the sciatic nerve and is not pressed on as the patient lies in bed. Many other muscle groups are suitable. It is unnecessary to put a badly wounded

man to the discomfort of turning him on a stretcher simply to give an intramuscular injection into his buttock, the *Bulletin* states. The external thigh muscles, deltoid muscle and pectoral muscles are often more conveniently accessible. Indeed, any large muscle away from important vessels or nerves may be used.

AUSTRALIA

(From Our Regular Correspondent)

May 20, 1944.

Problems of Anthropology in the Pacific

While the war is still raging in the Pacific it may seem premature to consider proposals for the future government and development of native races in the South Pacific islands. Yet, assuming that Australia's interest and responsibility in relation to mandated territories will be retained and possibly extended when the war is over, it is obvious that the welfare of the territory natives, whose friendship and assistance in the present conflict are of inestimable value to the Allied nations, must be taken into account in planning for postwar reconstruction.

This question is raised by J. W. Burton in a pamphlet entitled "Brown and White in the South Pacific," published by the Australian Institute of International Affairs. He declares that the impact of the present catastrophic war will affect the life and social order of the native races to an extent which at this stage cannot be determined, but it is obvious that the results will be deep and far reaching.

When Australians read of the heroic and unselfish part taken by the native stretcher bearers of Papua and New Guinea in the campaign against the Japanese, few give a thought to the effects of the war on social life of the island natives, the disruption caused in homes and villages, the demoralizing effect on the younger natives, the problem of restoring native agriculture and normal conditions of community life when peace returns.

Burton's pamphlet deals first with the native culture in the Pacific—a very old culture with roots that go deep into the past. "One may live for weeks in a native village," he says, "and feel its rhythm and charm, enjoy its laughter and gaiety, watch its colorful ceremonies and yet not suspect that the simplest actions and most commonplace habits have a long ancestry behind them and that every part of the common life is regulated by almost imperceptible rules of conduct." He states too that the South Sea social organization has been classed by some as communistic, although not in any marxian sense, and this element is admittedly present, for the life of the village is assuredly based, perhaps quite unconsciously, on the principle of "each for all and all for each." In Fiji, for instance, all land is held by the mataqali, or clan, and can never be alienated unless the mataqali itself dies out. While every man has his own house (in Fiji usually of an excellent type), no one can sell his house to another. Like the land, it belongs to the people as a whole, and the occupant has only the use of it.

It is pointed out that under this system there was no danger of property falling into a few hands, as with us. Mutual ownership of property prevented accretions of wealth and thereby restricted temporal power. No man ever went hungry, except for some visitation of nature, such as drought or flood; no one went unemployed, although there was abundant leisure.

With the introduction of the plantation system by white men came the indenture of native labor. It is true, says Mr. Burton, that the indenture system has its good side as far as the native is concerned. On the other hand, from the moral point of view, life on the plantations is far from ideal. Large numbers of men, separated for years from their women-folk and from the healthy influence of children, contract vices such as gambling, thieving and general irresponsibility, and return to exercise a bad influence on the village.

As to the evidence of the effects of the present war on the native life and social order, Mr. Burton says "In areas, particularly in the southeastern Pacific, where the actual devastation of war has not been felt, there are serious repercussions. The presence of tens of thousands of European servicemen, with plenty of money to spend and abundant leisure, has had a profound and immediate effect on native economy. There has come such an abundance of wealth that it has resulted in many places in natives neglecting their gardens and villages; they are content to do a little washing for the troops or sell a few curios at ridiculous prices and then spend their money in buying tinned meats and preserved fruits from the trader's store."

There is too, Mr. Burton adds, a serious disregard for the village authority, and the young girls have had their heads turned by the attentions of random admirers while their own men are away at other theaters of war. "There is no vivid imagination required to sense the dangers here," he says. "The case of those islands, particularly the Solomons, Papua and New Guinea, where the ravages of war have been so terrible, is even worse. No estimate can be made of the physical damage done. Hundreds of people have been killed, thousands have been torn away from their villages, and, although they have won a great name as stretcher bearers and carriers, no one may estimate the rupture of the social fabric of their lives."

There is evidence that both United States and Australian armies are conscious of these problems and are taking action to overcome them.

Australian Reaction to British Criticism of Medical Students' Training

The report of the planning committee of the Royal College of Physicians aroused interest here. The report stated that the average medical graduate has defects chiefly attributable to the manner of his training. He tends to lack curiosity and initiative. His powers of observation are relatively undeveloped, his ability to arrange and interpret facts is poor and he lacks precision in the use of words. In short, his training, however satisfactory it may have been in the technical sense, has been unsatisfactory as education.

Increase of scholarships as a method of overcoming financial barriers to the profession has the defect of compelling a boy to specialize in order to pass examination, at the expense of general education, especially in activities that develop personality and character. University education should be absolutely free, not only in medicine but in all other subjects. Allocation to universities would be on the merit of character plus ability, instead of wealth. Methods whereby the medical course itself can be improved include curtailment of certain traditional subjects, such as botany and topographic anatomy and, preeminently, division of medical education into two categories—the undergraduate course, which shall be general and unspecialized and designed to provide for doctors as a whole, and the postgraduate course, catering to special needs of gynecology, x-rays and other highly technical branches.

Dr. B. T. Zwar, deputy chancellor of Melbourne University and president of the Royal Melbourne Hospital, said that experience in the last war had shown that graduates of Australian medical schools compared very favorably with those from English schools, while our graduates who went to England were very highly regarded there. Dr. Zwar said he agreed, however, that there was insufficient preliminary general education before university courses were begun. Up to this year Melbourne University had accepted students at 16 years of age; now it is 17, but he felt that was still rather young. In England the General Medical Council had laid down that no medical student could register until within three months of his eighteenth birthday. Dr. Zwar was particularly

glad to note that the planning committee of the Royal College of Physicians had said that allocation to universities should be on "the merit of character, plus ability, instead of wealth." He said he had always advocated that some regard should be paid to the character of a student entering a profession; that was done in various American university medical schools, and the system had worked quite satisfactorily.

BRAZIL

(From Our Regular Correspondent)

SÃO PAULO, July 22, 1944.

Treatment of Chronic Osteomyelitis with Penicillin and Surgery

At the last meeting of the National Academy of Medicine a paper was presented by Dr. Mauricio Gudín on the treatment of 2 cases of chronic osteomyelitis in which surgery, under conditions of "integral asepsis of the environment," was associated with the use of penicillin. Dr. Gudín constructed, several years ago, a closed and entirely aseptic operating room, which he uses for his daily work at the Beneficência Portuguesa Hospital of Rio de Janeiro. This whole aseptic operating technic has also been adopted by a few surgeons of Paris, where the system was considered worth while. In Dr. Gudín's first case the illness began thirteen years earlier, and eight operations had been performed. Recently the patient had been treated, without result, with twenty-five intramuscular injections of penicillin prepared at the Oswaldo Cruz Institute. After the operation in the integrally aseptic room the patient received several local, intramuscular and intra-arterial injections of the same penicillin. The wound healed completely in seven days. The second patient became ill in 1937 and had been operated on three times by another surgeon. Dr. Gudín operated once more, this time under conditions of integral asepsis, and the wound was maintained opened. On the seventh day the dressing was undone in the aseptic room and it was ascertained that the wound was in good condition. On the fourteenth day the wound was again examined and a secondary suture was done. On the twenty-first day healing was judged complete. The treatment by penicillin was the same as in the first case.

Iodized Table Salt to Combat Goiter

Central Brazil has a great area where goiter is endemic, and iodine deficiency in several parts of this area has been ascertained. In order to help correct this situation Mr. João Alberto, coordinator of economic mobilization, signed a special order with the following main provisions: 1. All table salt to be consumed in the areas recognized as deficient in iodine shall be industrially processed to contain the amount of iodine judged appropriate by the Division of Food of the Office of the Coordinator. 2. The product to be immediately sold under the name of "iodized table salt" shall contain 10 mg. (15 grains) of iodine per kilogram (2.2 pounds) of table salt. 3. The Division of Food will furnish technical assistance to table salt producers to insure the effectiveness of this order. The order also established a limit on the increase in price to be charged for iodized table salt.

Relief of Pain in Renal Colic

Prof. Luis Surraco and Dr. Lockart have presented a new treatment for renal colic. According to their recent publication in Montevideo they proposed the inhalation of amyl nitrite as an unproved means to relieve the pain.

The pain in renal colic arises from a spasm of the smooth muscular fibers, surrounding the ureter as well as the visceral ducts, and provokes regional contracture, to which there is added a ureteral distention above and a zone of ischemia below, the whole acting through appropriate stimuli on a special state of hyperreflectivity of the aortic-renal plexus.

It is understood that the therapy in crisis, in order to be useful, should take the form of a sedative for the hypersensi-

tivity, an antispasmodic for the hypertonicity, a vasodilator favoring arterial irrigation and venous depletion. Responding to these demands, Surraco and Lockart have employed amyl nitrite, which has a well known action against the cardio-arterial spasm and which in renal colic produces the triple vasodilator, hypotensive and analgesic action through total intervention of the splanchnic nerves.

Immediately following inhalation they observed, together with the usual vascular phenomena, a complete and lasting cessation of the spontaneous pain, disappearance of the contracture of the abdominal wall through concomitant action on the striated muscular fiber and frequently a stimulation of diuresis. This quick action of the medicament is an important help in diagnosis in doubtful syndromes.

The immediate action of the amyl nitrite may be maintained and prolonged by employing glyceryl trinitrate after a few hours, repeating it according to the circumstances in the course of the first twenty-four or forty-eight hours.

Brief Items

Since the beginning of the war and the shortage of some medicinal products, the culture of *Mentha piperita* and the extraction of peppermint oil are being developed in São Paulo, Paraná and the other southern states of Brazil. At the price of \$30 per kilogram of crystallized menthol, as set by the United States government for the importation of the drug, the production of menthol is one of the best paid extractive industries. A free booklet on the culture of the plant is being distributed by the division of information of the Department of Agriculture.

Ten years ago on June 6, Dr. Miguel Couto, professor emeritus of medicine at the University of Rio de Janeiro, died at the age of 72. Dr. Couto had a large private practice in Rio de Janeiro and has been considered by some the greatest Brazilian doctor of the present century. The Brazilian Academy of Medicine held a special meeting to commemorate this anniversary.

The National University of Rio de Janeiro is a semiautonomous organization financially supported in large part by the federal government. The government has recently bought a large plot of land known as the Valqueire Park in a northern suburb of Rio de Janeiro, in which will be constructed the new buildings of the university.

Dr. Augusto Paulino Jr. has been elected a member of the National Academy of Medicine. Dr. Paulino is professor of surgery at the University of Rio de Janeiro.

The Brazilian Society of Ophthalmology recently held a meeting in which papers on endocrinologic problems in ophthalmology, tumors and refractive changes in diabetes were discussed. The most important papers were presented by Dr. Evaldo Campos, Dr. Orlando Cyrino and Dr. Sylvio de Campos.

Marriages

WILL BYRN ALSUP JR., Dublin, Ga., to Miss Martha Ham McRae of Charlotte, N. C., in Colorado Springs, Colo., August 4.

SAMUEL RICHARD STAGGERS, West Point, Miss., to Miss Sophy Malone Tilley of Durham, N. C., August 12.

JOHN JAY OSBORN, Garrison-on-Hudson, N. Y., to Miss Anne Mary M. Kidder of New York, August 6.

JAY EDWIN STOECKEL, Scranton, Pa., to Dr. CATHERINE M. ROTH of Roanoke, Va., July 22.

GRAHAM BURT BLAINE JR. to Miss Patricia Smallwood, both of New York, August 5.

HENRY T. SIMMONDS to Mrs. Edythe Graeber Wetzel, both of Shamokin, Pa., July 28.

ROBERT L. DILTS, Fort Wayne, Ind., to Miss Virginia Lewis of Indianapolis, July 28.

JOHN T. MANNING, Muskegon, Mich., to Miss Betty F. Letts of Flint, July 29.

Deaths

Charles Hartwell Cocke ☉ Asheville, N. C.; Cornell University Medical College, New York, 1905; served an internship in the Presbyterian Hospital, New York, in 1906-1907; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians, serving once as chairman of the board of governors and vice president in 1942, 1943 and 1944; in 1926 vice president of the Medical Society of the State of North Carolina; past president and secretary of the Buncombe County Medical Society; in 1932 vice president of the Southern Medical Association and in 1937 chairman of its section on medicine; fellow and former vice president of the American College of Chest Physicians; member and in 1934 vice president of the American Clinical and Climatological Association; member of the American Trudeau Society, American Association of the History of Medicine, American Sanatorium Association, Southern Interurban Clinical Club and the National Tuberculosis Association; corresponding member of the International Union Against Tuberculosis; attending physician, Asheville Mission Hospital and the Biltmore (N. C.) Hospital; consulting physician to the Patton Memorial Hospital, Hendersonville; one of the medical directors and attending physician, Zephyr Hill Sanatorium; member of the chamber of commerce; served as secretary and heart and lung consultant to the medical advisory board during World War I; died August 3, aged 62, of coronary occlusion.

Frederick Brown Moorehead ☉ Chicago; Rush Medical College, Chicago, 1906; professor of oral surgery and head of the department of oral and plastic surgery and oral pathology at the University of Illinois College of Dentistry; formerly associate clinical professor of surgery (oral and dental) at his alma mater; chairman of the Section on Stomatology, American Medical Association, 1914-1915, 1915-1916; member and in 1926-1927 president of the American Association of Oral and Plastic Surgeons; member of the Institute of Medicine of Chicago, Chicago Pathological Society and the Chicago Historical Society; fellow of the American College of Surgeons; specialist certified by the American Board of Plastic Surgery; joint author of "Pathology of the Mouth"; consulting plastic surgeon, Illinois Central Railroad System; consulting oral and plastic surgeon, Home for Destitute and Crippled Children; attending oral and plastic surgeon, Presbyterian Hospital, where he died August 29, aged 68, of peritonitis due to perforated gastric ulcer and bronchopneumonia.

Herman Elwyn Pearse, Bonner Springs, Kan.; St. Louis College of Physicians and Surgeons, 1888; honorary member of the Kansas Medical Society; past president of the Missouri State Medical Association and the Jackson County (Mo.) Medical Society; fellow of the American College of Surgeons; a founder and at one time professor of abdominal surgery at the Kansas City College of Physicians and Surgeons; formerly professor of surgery at the Kansas City Post-Graduate Medical School and Hospital; health director of Kansas City, Mo., 1925-1926; a member of the staff of St. Luke's Hospital, of which he had been a founder, and of St. Joseph, St. Mary's and Kansas City General hospitals, where in 1916 he had been chief of staff; died June 10, aged 84, of myocarditis.

Alfred A. Kent Sr., Winter Park, Fla.; Jefferson Medical College of Philadelphia, 1885; formerly a practitioner in Lenoir, N. C.; member and past president of the Medical Society of the State of North Carolina; organizer and once president of the Caldwell County (N. C.) Medical Society; for many years a member of the North Carolina State Board of Medical Examiners and for two years president; served as a member of the North Carolina State Board of Health and the North Carolina state legislature; an organizer and former president of the Citizens Building and Loan Association and president of the First National Bank of Lenoir; died August 11, aged 85.

William H. German, Chicago; Michigan College of Medicine, Detroit, 1883; member of the Illinois State Medical Society and the American Association of Railway Surgeons; served as a major in the Illinois National Guard; formerly member of the Morgan Park elementary, high school and library boards; for twenty-two years secretary of the Calumet Park district; since 1902 local surgeon for the Chicago, Rock Island and Pacific Railroad; died in the Wesley Memorial Hospital July 31, aged 89, of chronic myocarditis, chronic nephritis and bilateral lobar pneumonia.

Smylie Scott Anderson, Hammond, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1906; served as health officer of Hammond; died June 25, aged 66.

Thomas Rufus Aycock ☉ Monroe, Ga.; University of Georgia Medical Department, Augusta, 1909; served as acting president and secretary of the Walton County Medical Society; on the staff of the Walton County Hospital, Walker Park; died in St. Joseph Infirmary, Atlanta, August 5, aged 62, of heart disease following an operation.

Charles Wesley Banks, East Orange, N. J.; Bellevue Hospital Medical College, New York, 1890; formerly city pathologist; served as chief of staff and chief surgeon of St. Mary's Hospital in Orange for many years; for many years in charge of the infirmary of the Thomas A. Edison, Inc., plant in West Orange; died July 21, aged 77, of carcinoma of the bladder.

John Banks, Hamilton, Ga.; Atlanta School of Medicine, 1911; died May 16, aged 65.

Blaine B. Barton, Markleysburg, Pa.; Maryland Medical College, Baltimore, 1905; member of the Medical Society of the State of Pennsylvania; died July 8, aged 64, of cerebral hemorrhage.

Burton Wayne Bivins, Wonewoc, Wis.; Chicago College of Medicine and Surgery, 1904; Spanish-American War Veteran; died in Chetek June 7, aged 68, of coronary thrombosis.

Stanislaus N. Borowiak, Buffalo; University of Buffalo School of Medicine, 1908; served as president of the board of education of Buffalo; secretary-treasurer of the Polish Medical Association, 1910-1914; in 1933 received the Polonia Restituta medal from the Polish government for aid in the restoration of Poland; died in the Millard Fillmore Hospital July 11, aged 61, of myocardial failure and coronary arteriosclerosis.

Oliver Preston Bourbon ☉ Los Angeles; Kansas City (Mo.) Hahnemann Medical College, 1908; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; formerly assistant professor of surgery (ophthalmology), College of Medical Evangelists; at one time lecturer on physiology at his alma mater; on the staffs of the Methodist Hospital and the California Hospital, where he died April 25, aged 80, of coronary thrombosis.

Christopher William Brown, Brooklyn; Long Island College Hospital, Brooklyn, 1903; member of the Medical Society of the State of New York; on the staff of the Bushwick Hospital for many years; during World War I served as a captain with the thirteenth Regiment Coast Artillery; died in the Long Island College Hospital July 7, aged 64, of carcinoma of the stomach with metastases to the spine.

Emerson Marrs Bushnell ☉ Black Lick, Pa.; University of Vermont College of Medicine, Burlington, 1903; president of the Indiana County Medical Society in 1936; school director and bank president; served on the staff of the Indiana Hospital, Indiana, Pa.; died April 21, aged 67, of coronary disease.

William Aaron Cashion, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, Tenn., 1915; a captain in the medical corps of the U. S. Army during World War I; formerly associated with the U. S. Veterans Administration; died July 1, aged 53, of coronary occlusion due to cardiorenal vascular disease.

Charles Eli Caylor ☉ Bluffton, Ind.; Kentucky School of Medicine, Louisville, 1893; in 1895 president of the Wells County Medical Society; a charter member of the Bluffton Rotary Club; member of the Southern Medical Association; chief of staff of the Caylor-Nickel Clinic, which he founded, and of the Clinic Hospital, where he died July 5, aged 74, of a skull fracture and other injuries received in an automobile accident.

Emily Clark Charles, New York; New York Medical College and Hospital for Women, Homeopathic, New York, 1894; subsequently served at her alma mater as lecturer on diseases of children, assistant to the chair of diseases of children, secretary of the faculty, associate professor of diseases of children, professor of materia medica and dean; died in the Franklin County Hospital, Greenfield, Mass., July 9, aged 80, of a strangulated femoral hernia.

William Fladger Clark, Tampa, Fla.; Emory University School of Medicine, Atlanta, 1922; died in the Tampa Municipal Hospital July 11, aged 49, of bronchopneumonia and general septicemia.

Daniel Crosby ☉ Oakland, Calif.; Cooper Medical College, San Francisco, 1898; past president of the Alameda County Medical Association; fellow of the American College of Surgeons; health officer of Oakland, 1918-1920; past president of

the Insurance Association of Approved Hospitals; on the staffs of the Providence and Peralta hospitals, Oakland, and the Alameda Hospital, Alameda; died at his home in Piedmont July 15, aged 69, of coronary thrombosis.

Nelson Park Davis @ Pittsburgh; University of Pittsburgh School of Medicine, 1909; associate professor of surgery at his alma mater; fellow of the American College of Surgeons; on the staff of the Mercy Hospital; died July 7, aged 58, of cerebral hemorrhage.

Lester Cornelius Diddy, Paxton, Ill.; Chicago College of Medicine and Surgery, 1907; member of the Illinois State Medical Society; past president of the Ford County Medical Society; died July 11, aged 61, of coronary heart disease.

Hugh Victor Du Bois, Niota, Tenn.; Chattanooga (Tenn.) Medical College, 1904; died July 7, aged 64, of heart disease.

Harry Edward Dunlop @ Pelham, N. Y.; University of the City of New York Medical Department, New York, 1886; an Affiliate Fellow of the American Medical Association; died in the Gallagher Nursing Home, Mount Vernon, July 14, aged 80, of transverse myelitis and uremia.

Elihu Noble Elliott, Chicago; College of Physicians and Surgeons, Chicago, 1883; member of the Illinois State Medical Society; died June 29, aged 82, of carcinoma of the prostate with metastasis, pyelocystitis and cerebral arteriosclerosis.

Ralph Waldo Emerson, Owensville, Ind.; Eclectic Medical Institute, Cincinnati, 1898; died July 3, aged 74, of heart disease.

William Albert Fisher @ Chicago; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1885; at one time president and professor of ophthalmology at the Chicago Eye, Ear, Nose and Throat College; formerly professor of clinical ophthalmology at the University of Illinois College of Medicine; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; died July 31, aged 84.

Thomas Francis Foley, Buffalo; University of Buffalo School of Medicine, 1904; for many years staff physician in the child hygiene division of the city health department; a captain in the medical corps of the U. S. Army during World War I; medical examiner at the Attica State Prison; died July 11, aged 68, of pulmonary edema and dilatation of the heart.

Frederick Lewis Forker, Binghamton, N. Y.; University of the City of New York Medical Department, 1885; served as a member of the board of education; on the staffs of the Binghamton City and Our Lady of Lourdes Memorial hospitals; died July 11, aged 83, of arteriosclerosis.

William Hodskin Gale, St. Johns, Mich.; Jefferson Medical College of Philadelphia, 1901; formerly secretary and treasurer of the Clinton County Medical Society; served in the medical corps of the U. S. Army during World War I; in 1910 appointed to the U. S. Board of Pensions; for many years county health officer; on the staff of the Clinton Memorial Hospital; served as district surgeon for the Grand Trunk Railroad; died June 30, aged 74, of cardiorenal disease.

John Asa Gibbons, Mitchell, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1898; died in the Dunn Memorial Hospital, Bedford, July 6, aged 71, of carcinoma of the rectum.

John Louis Gilleland, Pullman, Wash.; American Medical College, St. Louis, 1903; member of the Washington State Medical Association; formerly on the staff of St. Ignatius Hospital, Colfax; died June 5, aged 69, of carcinoma of the prostate and Parkinson's disease.

Thomas Leverett Gingold, New Haven, Conn.; Columbia University College of Physicians and Surgeons, New York, 1919; formerly police surgeon and alderman; served on the staff of the Grace Hospital, where he died July 6, aged 49, of carcinoma of the pancreas.

Faustine Graves, Piney Flats, Tenn.; Tennessee Medical College, Knoxville, 1894; died July 13, aged 76, of myocardial failure and Parkinson's disease.

J. Edward Harmon, Pine Knot, Ky.; Hospital College of Medicine, Louisville, 1905; died in St. Anthony's Hospital, Louisville, June 29, aged 65, of hypertensive cardiovascular disease.

John Edward Harris, Winchester, Va.; Medical College of Virginia, Richmond, 1900; secretary-treasurer of the Medical Society of Northern Virginia and of the Winchester Memorial Hospital; died May 30, aged 69.

Atticus Greene Haygood @ Downey, Calif.; University of Nashville (Tenn.) Medical Department, 1891; Vanderbilt University School of Medicine, Nashville, 1891; a captain in the medical corps of the U. S. Army during World War I; examiner for the Selective Service Board; on the staff of the Methodist Hospital, Los Angeles; a charter member and past president of the Kiwanis Club; died in the Downey Community Hospital June 27, aged 73, of bronchopneumonia and acute gastroenteritis.

Edward Lathrop Hill Jr., Jacksonville, Ill.; St. Louis University School of Medicine, 1933; member of the Illinois State Medical Society; formerly an intern at St. Louis City Hospital and resident in neuropsychiatry at the City Sanatorium in St. Louis; first lieutenant in the medical reserve corps of the U. S. Army not on active duty; health officer in charge of the McDonough-Fulton bicoounty health unit of the state health department with headquarters in Macomb; died in the Barnes Hospital, St. Louis, aged 37, of myelogenous leukemia.

Joseph Harrison Humphrey @ St. Louis; Washington University School of Medicine, St. Louis, 1901; served as director of hygiene for the board of education; died in the Evangelical Deaconess Home and Hospital June 23, aged 67, of cerebral embolism.

John Charles Kamp, Saugerties, N. Y.; University of Buffalo School of Medicine, 1895; member of the Medical Society of the State of New York; health officer since May 1924 with jurisdiction over the consolidated health district of Saugerties; served on the staff of the Kingston Hospital, Kingston; died June 18, aged 84, of arteriosclerosis.

Edwin Jerome Kauffman, Marion, S. D.; College of Physicians and Surgeons, School of Medicine of the University of Illinois, 1906; member of the South Dakota State Medical Association; formerly councilman; on the staffs of the Methodist State Hospital, Mitchell, and the Sioux Valley Hospital, Sioux Falls, where he died May 1, aged 60, of coronary thrombosis.

Theophilus Kubricht, Wallis, Texas; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; also a minister; died in a sanatorium in Houston May 28, aged 80.

Charles Labash, Passaic, N. J.; Chicago Medical School, 1926; member of the Medical Society of New Jersey; died in St. Mary's Hospital June 26, aged 61, of cirrhosis of the liver.

Virgil Alfred Lea, Gloster, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1905; died in the Marion Butler Memorial Hospital, Liberty, August 6, aged 63, of injuries received in an automobile accident.

Thomas B. W. Leland, San Francisco; University of California Medical Department, San Francisco, 1894; formerly county and city coroner; served as a lieutenant commander in the U. S. Navy during World War I; died June 28, aged 74.

Frederic Michael Lemen, Buffalo; University of Buffalo School of Medicine, 1905; member of the Medical Society of the State of New York; on the staff of the Millard Fillmore Hospital; died June 24, aged 64, of leukemia.

Patrick F. Martin, Emmitsburg, Md.; University of Maryland School of Medicine, Baltimore, 1900; member of the Medical and Chirurgical Faculty of Maryland; served as coroner in eastern and western health districts of Baltimore; for many years resident physician at the Mount St. Mary's College; died June 18, aged 67, of uremia.

Hubert Burns Marvin @ Binghamton, N. Y.; University of Buffalo School of Medicine, 1907; fellow of the American College of Physicians; examiner for draft board number 453; member of the examining board during World War I; on the staff of the Susquehanna Valley Home and the Binghamton City Hospital, where he died June 20, aged 64, of pneumonia.

Roy Cowles McDaniel @ Portland, Ore.; Medico-Chirurgical College of Philadelphia, 1905; fellow of the American College of Surgeons; served as secretary-treasurer of the Eastern Oregon District Medical Society; first vice president of the Oregon State Medical Society, 1909-1910; member of the staffs of St. Vincent's, Emanuel and Good Samaritan hospitals; died June 16, aged 62, of coronary occlusion.

Gertrude Minthorn, Newport, Ore.; State University of Iowa College of Medicine, Iowa City, 1910; formerly a medical missionary in India; died June 28, aged 62, of chronic endocarditis.

Edwin Pendleton Moon, Wetumpka, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1898; member of the Medical Association of the State of Alabama; served as state physician for prison number 1 and the tuberculosis hospital; died June 10, aged 67, of arteriosclerosis.

Nathan Vernon Noble, St. Mary's, Ohio; Starling-Ohio Medical College, Columbus, 1911; member of the Ohio State Medical Association; an officer in the medical corps of the U. S. Army during World War I; on the staffs of the Memorial and St. Rita's hospitals; died June 26, aged 55, of coronary thrombosis.

Carlton V. Norcross, Butte, Mont.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1887; died May 20, aged 80.

Clifford Seeley Page, Sisseton, S. D.; Yale University School of Medicine, New Haven, Conn., 1896; formerly coroner of Clark County, Neb., and camp surgeon for the Civilian Conservation Corps in New Ulm, Minn.; physician for the Indian agency; died in the Peabody Hospital, Webster, May 15, aged 68.

Howard Ashley Pardee, Upper Montclair, N. J.; University of the City of New York Medical Department, 1880; retired in 1934 as medical director of the United States Life Insurance Company, a position he held for many years; died July 23, aged 85, of acute congestive heart failure secondary to chronic myocarditis and arteriosclerosis.

Lester Claude Pepper Ⓢ Sidney, Ohio; Starling Medical College, Columbus, 1898; formerly member of the legislative committee, past president, vice president, delegate and secretary of the Shelby County Medical Society; served as county coroner and as examining physician for the local Selective Service Board; died in the Wilson Memorial Hospital June 23, aged 68, of cerebral hemorrhage.

Carl Anton Platou, Valley City, N. D.; Maryland Medical College, Baltimore, 1912; member of the North Dakota State Medical Association; served during World War I; on the staff of the Mercy Hospital; died in Pompano, Fla., May 22, aged 56, of coronary occlusion.

Hyman Leön Ratnoff Ⓢ New York; Cornell University Medical College, New York, 1906; on the staffs of the Beth-El and Kingston Avenue hospitals; died June 25, aged 62, of coronary thrombosis.

Volney E. H. Reed, Austin, Texas; Missouri Medical College, St. Louis, 1881; served as president of the bank in Holland for many years; formerly health officer of Milan County; died June 3, aged 84.

Clarence William Robertson Ⓢ Jamestown, N. D.; Rush Medical College, Chicago, 1915; on the staffs of the Jamestown and Trinity hospitals; died May 22, aged 53, of coronary thrombosis.

Walter C. Robinson, Atlanta, Ga.; Southern Medical College, Atlanta, 1881; honorary member of the Medical Association of Georgia; died June 17, aged 88, of cerebral embolism.

William Taylor Salmon, Duncan, Okla.; University of Tennessee Medical Department, Nashville, 1892; formerly associated with the Indian Service; died June 26, aged 75, of cranial hemorrhage and hypertension.

Charles Matthew Scott, Bluefield, W. Va.; University College of Medicine, Richmond, 1901; member of the West Virginia State Medical Association; fellow of the American College of Surgeons; past president of the county board of health; founder and head of St. Luke's Hospital; established the St. Luke's Nurses Training School; for eight years secretary of the state board of examiners for nurses; died in the University Hospitals, Iowa City, August 17, aged 65, of pneumonia following an operation.

John Sidney Sharp, Grenada, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1895; member of the Mississippi State Medical Association; for many years a member of the state board of health; member of the Grenada Clinic since its organization; on the staff of the Grenada General Hospital; chief surgeon in the area for the Illinois Central Railroad; died August 5, aged 72, of carcinoma of the prostate.

Isaac Judah Silverman Ⓢ Washington, D. C.; University of Melbourne Faculty of Medicine, Australia, 1911; professor of clinical psychiatry at the Georgetown University School of Medicine; member of the American Psychiatric Association; fellow of the American College of Physicians; on the staff

of the Gallinger Municipal Hospital; died August 6, aged 55, of acute myocardial infarction (posterior) and arteriosclerotic heart disease.

Rufus Southworth, Glendale, Ohio; Miami Medical College, Cincinnati, 1904; served as associate professor of therapeutics at the University of Cincinnati College of Medicine; served in the medical corps of the U. S. Army during World War I; formerly a medical missionary in China; made a memorable trip around the world in the schooner *Yankee*; formerly on the staff of the Cincinnati General Hospital; died in the Christ Hospital, Cincinnati, June 14, aged 65, of cerebral hemorrhage.

Vivienne Eu Gene McMains Spencer, Sterlington, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1930; served on the staff of St. Francis' Sanitarium, Monroe; died in El Paso, Texas, June 26, aged 39, of military tuberculosis.

Edward Charles Stoeltje, Rosebud, Texas; Louisville (Ky.) Medical College, 1897; member of the State Medical Association of Texas; killed in an automobile accident in Galveston June 20, aged 71.

Henry Marshall Swift Ⓢ Cape Elizabeth, Maine; Harvard Medical School, Boston, 1900; assistant in neuropathology at Tufts College Medical School, Boston, 1907-1908; formerly professor of neurology at the Bowdoin Medical School, Portland; served during World War I; member of the American Psychiatric Association and the New England Society of Psychiatry; at one time on the staff of the Danvers Insane Hospital, Danvers, Mass.; past president of the Portland Medical Club; died August 18, aged 72.

Gaston E. Trosclair, Thibodaux, La.; University of the South Medical Department, Sewanee, Tenn., 1903; died in St. Joseph Hospital June 30, aged 67, of heart disease, nephritis and hypertrophic cirrhosis of the liver.

Thomas Freeman Turner Ⓢ Macon, Mo.; Washington University School of Medicine, St. Louis, 1925; served an internship at St. Luke's Hospital, Kansas City; county physician; aged 42; drowned in Macon Lake June 28 when the motor boat in which he was riding capsized.

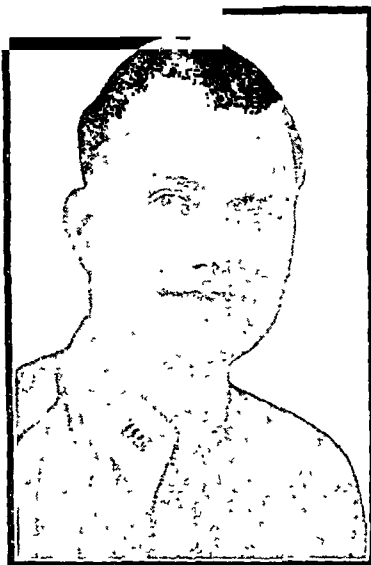
Elbert Lycurgus Watson Ⓢ Newport, Ark.; Columbia University College of Physicians and Surgeons, New York, 1900; past president of the Arkansas State Board of Health; president of the Jackson County Medical Society; a captain in the medical corps of the U. S. Army during World War I; at one time mayor of Newport, served as county health officer; physician for the Missouri Pacific Railroad Company; died June 3, aged 68.

Myron La Verne White Ⓢ Coffeyville, Kan.; Dunham Medical College, Chicago, 1901; served during World War I; died in the Mercy Hospital, Independence, June 4, aged 71, of cirrhosis of the liver and bronchopneumonia.

James Frederick Young, Danbury, Conn.; Columbia University College of Physicians and Surgeons, New York, 1913; served in the medical corps of the U. S. Army during World War I; died June 27, aged 55.

KILLED IN ACTION

Elmer Norval Carter, Huntington, W. Va.; Medical College of Virginia, Richmond, 1937; member of the West Virginia State Medical Association; served an internship at the Scott and White Hospital in Temple, Texas, a residency in psychiatry at the Spencer State Hospital, Spencer, and a residency in medicine at the Chesapeake and Ohio Hospital; commissioned a first lieutenant in the medical corps of the Army of the United States July 7, 1942 and began active duty on Aug. 10, 1942; in 1943 ordered to England, where he was assigned to hospital duty; promoted to captain; battalion surgeon in the Twenty-Ninth Division; killed in action in Normandy June 19, aged 32.



CAPT. ELMER N. CARTER
M. C., A. U. S., 1911-1944

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices or cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Amisogen.—In December 1943 J P Hoft, Berwyn, Ill., and the A N Baker Advertising Agency, Inc., Chicago, stipulated with the Federal Trade Commission that they would discontinue the following misrepresentations in the advertising of this product: That it will have any effect on asthma except to the extent that it may afford palliative relief from the paroxysms of this disease, that it will relieve hay fever or its symptoms, or that the product is free from opiates or narcotics. They further agreed not to disseminate any advertisement which fails to reveal that the product should not be used in excess of the dosage recommended, that frequent or continued use of it may be habit forming or cause nervousness, restlessness or sleeplessness and that the product should not be used by persons suffering from high blood pressure, heart disease, diabetes or thyroid trouble. It was provided, however, that such advertisements need only contain the statement, "Caution Use Only as Directed" if the labeling directions contain a warning to the same effect.

Buxton's A Special Compound.—This is marketed by a Hope Buxton, trading as Buxton Medicine Company, Abbot Village, Maine. In November 1943 this person stipulated with the Federal Trade Commission to cease representing that the product has been approved by a federal agency, that it is a remedy or cure for sciatica, arthritis, neuritis, diseased liver, stomach or kidneys, that it eliminates uric acid from the system, overcomes acidity, strengthens the heart, normalizes the kidneys or bladder, purifies the blood or is a treatment for ingestion or stomach trouble.

Cramer Chemical Company's Preparations.—The concern in question, located at Gardner, Kan., stipulated with the Federal Trade Commission in December 1943 that it would discontinue the following misrepresentations: That "Nitrotran" is the best known or most universally used germicide in the United States, produces complete sterilization in 90 seconds, checks or stops bleeding other than capillary bleeding from superficial skin lesions, draws the torn, jagged edges of a wound together, stops sore throat, assists in the prevention of influenza, or may be relied on for quick and safe recovery from all skin conditions, that "Cramer's Athletic Stringent for Gargle" is effective in checking or preventing influenza, tonsillitis or like disorders, that "Cramer's Athletic Liniment" has special penetrating powers or reaches into muscular or other tissues to any significant degree, that "Cramer's Dextrose Tablets" will produce quick energy in the sense of capacity for more intense physical exertion, stimulate an athlete to greater performance, enable him to win more games, or afford immediate relief from hay fever or asthma, that "Cramer's Athletic Hair Oil" prevents "shower bath baldness" or any other kind of baldness, that "Iso Pine" is a suitable preparation for sterilizing surgical instruments, that "Cramer's Athletic Effervescent Alkaline Powder" relieves acid condition of the system or has any significant effect on the acid base balance of the body, that "Athletic Ointment" has any therapeutic effect on boils or performs any function in the healing process, that "Athletic Red Hot Ointment" relieves deep seated pain or affords adequate relief from sprains, that "Athletic Analgesic Balm" relieves congestion, that "Athletic Foot Ointment" is an effective treatment for athlete's foot or ringworm except in mild cases, that "Athletic Inhalant" effectively relieves sinus trouble or forms a protective coating against bacteria, that "Cramer's Cold Tablets" have any appreciable effect in preventing common colds, or that "Cramer's Athletic Alkaline Powder" relieves nausea or stomach sickness, regard less of the nature or cause thereof. The respondent also agreed to cease using the word "Antiseptic" as part of the trade name or designation of "Cramer's Athletic Antiseptic Powder," or indicating in any way that the nostrum has antiseptic properties.

Dr Gray's Foot Bath Powder.—In November 1943 S W Ward, trading as Ward & Sons, Chicago, entered into a stipulation with the Federal Trade Commission to discontinue the following misrepresentations in advertising the product: That it is used by physicians, hospitals or sanatoria, that it is a result of scientific research or a study of foot ailments, that statements in the advertising have been made by, or are quotations from, the literature of the United States Public Health Service or that the latter or any other agency of the government has endorsed or recommended the use of this powder; that a package of it has a greater value than the price at which it is regularly sold, that its price is limited as to time, or that the powder draws poison from the feet, has curative or healing powers, or destroys germs. Ward further agreed to discontinue the representations that no other products are as effective as his powder is in the treatment of athlete's foot, itching, broken skin, open sores and blisters, that its use will prevent athlete's foot, or that the coloring of the skin caused by the powder destroys infection.

Elastic Rupture-Guard.—This is put out by a T E Brooks, trading as the Rupture Guard Company, Marshall, Mich. In December 1943 Brooks and Ralph L Wolfe & Associates, Inc., an advertising agency stipulated with the Federal Trade Commission that they would discontinue representations that the device in question may be properly fitted to one's personal requirements when ordered through the mails, will hold the rupture securely or comfortably in any position of the body, will assist nature in strengthening the muscles or in closing the hernia opening, or that it is the only device of its kind, further, that we will cease representing that the use of the device will eventually enable one to go without a truss or will correct or cure rupture, that it will stay in position under all conditions of use, that it is more natural or comfortable than other trusses, or that satisfaction in using it is guaranteed, unless the terms of the guaranty are disclosed.

Sar-Tol Cough Syrup, Cough Drops and Nose Drops.—On Dec 8 1943 the Federal Trade Commission reported that it had accepted a stipulation from O B Whitaker, trading as the O B Whitaker Manufacturing Company, Joplin, Mo. In this he agreed to cease representing that his preparations, whether used alone or in combination, prevent or cure colds, have any curative effect on the underlying factors which cause colds, or cure throat irritations, prevent fatigue, maintain health or build in building body resistance. Further, he agreed to cease representing that Sar-Tol Cough Drops neutralize tobacco, onion or other odors. Also, Whitaker agreed to discontinue any advertisement which did not conspicuously warn that frequent or excessive use of the Nose Drops may cause injury to the lungs, nervousness, restlessness or sleeplessness, and should not, except on competent advice, be given to infants or young children, or be taken by persons suffering from high blood pressure, heart disease, diabetes or thyroid trouble. It was provided however, that such advertisements need only contain the statement "Caution Use Only as Directed" if and when the directions in the labeling contain a warning to the same effect.

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated DDN] and foods, F N J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment, (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Arabian Oil.—Standard Drug Company, Inc., Spartanburg, S C Shipped Feb 28 and March 13, 1941. Composition essentially a mixture of soap, ammonia, turpentine and water. Misbranded because the ammonia and turpentine present might be irritating to the skin, particularly if applied with rubbing, and also to eyes or mucous membranes, whereas label did not warn against this. Further misbranded because label falsely represented the product as a cure, treatment or preventive of pain incident to rheumatism, lame back, stiff joints, croup, swellings, wounds, and some other disorders.—[DDN J, FDC 805, December 1943]

Glimax C & P R.—Standard Drug Company, Inc., Spartanburg, S C Shipped Feb 28 and March 13, 1941. Composition essentially water, alcohol, chloroform and plant drugs, including capsicum. Misbranded because of false and misleading label representations for the product as a cure, treatment or preventive of pain in the bowels, cramp, colic and diarrhea.—[DDN J, FDC 805, December 1943]

Gloria Tonic Tablets.—John A Smith Company, Oconomowoc, Wis. Shipped Oct 20, 1941. Composition in each tablet 0.77 grain of iron, 3.64 grains of sodium salicylate, 0.003 grain of colchicin, and an extract of cascara sagrada in an undeclared amount. Adulterated because strength differed from that which it was represented to possess, namely, in each tablet 1 grain of reduced iron, 5 grains of sodium salicylate and 1/250 grain of colchicin. Misbranded because directions on label did not provide for sufficient medication to constitute a treatment for gout, because, though a laxative, it failed to warn adequately that product should not be taken when symptoms of appendicitis were present, such as abdominal pain, nausea and vomiting and that frequent or continued use might result in dependence on laxatives, also misbranded because statement "Tonic An Allevial (sic) Treatment Useful in Gout" was false and misleading, since the tablets, when used as directed did not constitute a tonic or treatment for gout.—[DDN J, FDC 762, September 1943]

Royale Agar and Oil with Phenolphthalein.—Vital Laboratories, Union City, N J Shipped Jan 7 and March 21, 1942. Composition an emulsion containing mineral oil and phenolphthalein. Misbranded in that it bore no labeling containing adequate directions for use, or the warning that it should not be taken when nausea, vomiting, abdominal pain or other symptoms of appendicitis are present, or the caution that frequent or continued use might result in dependence on laxatives. Further misbranded because name and place of business of manufacturer, packer or distributor were not given, or an accurate statement of the quantity of the contents or the common or usual name of each active ingredient.—[DDN J, FDC 758, September 1943]

Correspondence

CANCER SAID TO BE CAUSED BY A SINGLE INJURY

To the Editor:—I am interested to note your editorial of August 12 on the matter of claims for disability said to have resulted from cancer caused by a single injury. In my opinion this editorial is timely but scarcely goes far enough. Traumatic cancer attracted my interest for a rather brief period following the death of the late Dr. James Ewing. Dr. Ewing had been interested in this matter for years and at his death a number of unfinished cases were turned over to me for completion.

In the course of hearings in these cases I acquired an exceedingly bad taste both for certain members of the legal profession and for members of the medical profession who seemed to me to be quite willing to testify to almost anything for a fee. I likewise learned to distrust the type of referee who is so afraid of possible injustice to a claimant that he tends to make awards in the face of incompetent evidence, and I believe he actually practices sociology rather than medicine. He rewards the "deserving" laborer at the expense of the insurance carrier and in so doing uses supposedly scientific medicine to further his notion of proper social behavior.

As for medical testimony, it appears to me that (1) such testimony can be purchased at a price or (2) those individuals who testify are hopelessly ignorant of the commonly known facts of cancer pathogenesis, which in turn is the result either of bad teaching in the cancer field or of dependence on casual statements heard in medical schools or encountered in textbooks on the subject. Lastly, it would oftentimes seem that the supposed expert doesn't take the trouble to reason at all. Let me illustrate: The same surgeon who will testify that mammary cancer has resulted from a single trauma will at the least provocation operate for a benign lesion of the breast and would never think of warning a patient that because of his operative trauma, which usually greatly exceeds the casual industrial trauma, she should give heed to the possibility that she will develop a cancer of the breast. The same surgeon who will do all sorts of orthopedic jobs involving chiseling into bone or insertion of such objects as ice tongs or pins or screws may testify that a blow which has left no real signs has caused an osteogenic sarcoma, although he never thinks his surgery will do so nor has he ever warned a patient with the severest form of bone trauma—a fracture—to be on the lookout for a possible sarcoma. A man testifies that a blow has caused a soft part sarcoma and yet that man and his colleagues throughout the world will do hundreds of thousands of appendectomies involving the cutting of abdominal wall musculature and observe no tumors. Another says that a malignant melanoma has followed a pin prick and yet no melanoma has ever followed the millions of venipunctures for complement fixation tests or intravenous medication. A third will say that testis cancer is the result of single trauma although the same tumor, histologically indistinguishable, appears in the ovary and no one assigns that to trauma. As far as I know I have never seen a cancer which I could logically and irrevocably assign to single trauma and, even more important than that, I do not know that any one has ever observed the development of a process which could be called "precancerous" after a trauma. The absurd efforts made in our compensation courts to emphasize the severity of traumas rests on the nonsensical point of view that there is some dividing line between the degree of trauma which will or will not cause cancer, under the popular supposition that the metabolic changes which make a cell a cancer cell require a few additional dynes for their complete florescence.

Some means should be found to exclude these figments of imagination from our compensation courts and place such claims

in the hands of a truly expert commission—not composed of individuals who have nothing else to do or who have political friends either within medicine or without—and make the findings of this commission binding on the compensation referee, thus avoiding time wasted at hearings, questions and insults from cheap lawyers, and the mental anguish resulting from having to listen to the testimony of ignorant doctors, that in itself, judged by medicolegal standards, might be deemed a sufficient cause for development of a glioma in the expert. I tried this in a way. That is, I wrote a few letters to people who should have been interested and didn't get anywhere and am unable to wage a one man war on the racket. It will certainly be hard to break, for, under the law, compensation is profitable to claimant, physician and lawyer, and of course in the end the public foots the bill.

FRED W. STEWART, M.D., New York.

Acting Director, Memorial Hospital for the
Treatment of Cancer and Allied Diseases.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 8-12. Dr. W. L. Benedict, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Hospital Association, Cleveland, Oct. 26. Mr. George P. Bugbee, 18 East Division St., Chicago, Executive Secretary.

American Pediatric Society, Atlantic City, N. J., Sept. 25-27. Dr. Hugh McCulloch, 325 N. Euclid Ave., St. Louis 8, Secretary.

American Public Health Association, New York, Oct. 3-5. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, Executive Secretary.

American Roentgen Ray Society, Chicago, Sept. 24-29. Dr. H. Dabney Kerr, University Hospitals, Iowa City, Secretary.

Association of American Medical Colleges, Detroit, Oct. 23-25. Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary.

Association of Military Surgeons of the United States, New York, Nov. 2-4, Col. James M. Phalen, Army Medical Museum, Washington 25, D. C., Secretary.

Colorado State Medical Society, Denver, Sept. 27-29. Dr. John S. Bouslog, 537 Republic Bldg., Denver 2, Secretary.

Delaware, Medical Society of, Lewes, Sept. 11-12. Dr. W. O. La Motte, 601 Delaware Avenue, Wilmington, Secretary.

District of Columbia, Medical Society of the, Washington, Oct. 5-7. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.

Indiana State Medical Association, Indianapolis, Oct. 3-5. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis 4, Executive Secretary.

Inter State Postgraduate Medical Association of North America, Chicago, Oct. 17-20. Dr. Arthur G. Sullivan, 16 N. Carroll St., Madison, Wis., Managing Director.

International College of Surgeons, U. S. Chapter, Philadelphia, Oct. 3-5. Dr. Desiderio Roman, 250 South 17th St., Philadelphia, Secretary.

Kentucky State Medical Association, Lexington, September 18-20. Dr. P. E. Blackerby, 620 S. Third St., Louisville, Secretary.

Michigan State Medical Society, Grand Rapids, Sept. 27-29. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Secretary.

Mississippi Valley Medical Society, Peoria, Ill., Sept. 27-28. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Omaha Mid-West Clinical Society, Omaha, Nebraska, Oct. 23-27. Dr. J. D. McCarth, 1036 Medical Arts Bldg., Omaha 2, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Sept. 19-21. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh 22, Secretary.

Radiological Society of North America, Chicago, Sept. 24-29. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Virginia, Medical Society of, Richmond, Oct. 23-25. Miss Agnes V. Edwards, 1200 E. Clay St., Richmond 19, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 18-20. Mr. Charles H. Crownhart, 110 E. Main St., Madison 3, Secretary.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Cerebral Hemorrhage Following Exertion in Hot Weather by Syphilitic Workman.—The workman, a Negro about 40 years of age, had syphilis in the tertiary state. The court nevertheless states that he enjoyed good health prior to the date of the industrial accident here discussed. On May 1, 1942, a "very warm" day, he had been unloading lumber from boxcars. About 7 p. m. he became overheated and had a dizzy feeling but continued to work another hour until his work day was finished. He was sick at home all night but returned to work next morning, when he became unconscious and was unable to begin work. Subsequently he suffered a cerebral hemorrhage which resulted in paralysis of his left side. He was denied compensation under the Florida workmen's compensation act and appealed to the circuit court, Leon County, which affirmed the denial of compensation. He then appealed to the Supreme Court of Florida.

The Florida workmen's compensation act, said the Supreme Court, so far as here pertinent, provides as follows:

"Accident" shall mean only an unexpected or unusual event, happening suddenly. . . . Where a preexisting disease is accelerated or aggravated by an accident arising out of and in the course of the employment, only acceleration of death or the acceleration or aggravation of disability reasonably attributable to the accident shall be compensable.

On just what precise reason the trial court denied compensation is not clear. Presumably the employer and his insurance carrier must have argued that Davis's disability was due solely to the syphilitic condition and that there was no causal connection between the exertion of employment and the disability. The Supreme Court concluded that Davis was entitled to compensation on the theory that the exertion of his employment had accelerated or aggravated his syphilitic condition. The court relied, among other cases, on *Crowley's Case*, 223 Mass. 288, 111 N. E. 786. The Massachusetts statute, said the Supreme Court, was similar to the Florida statute to be construed. In that case also the employee had syphilis but, being dormant, it left his ability unimpaired to carry on his work. Exertion of employment, apparently, was followed by paralysis or insanity and total disability. The employer and his insurance carrier contended that the workman could not recover under the Massachusetts workmen's compensation act because of the preexisting syphilitic condition. The court there said.

The statute prescribes no standard of fitness to which the employee must conform, and compensation is not based on any implied warranty of perfect health, or of immunity from latent and unknown tendencies to disease, which may develop into positive ailments, if incited to activity through any cause originating in the performance of the work for which he is hired. What the legislature might have said is one thing, what it has said is quite another thing, and in the application of the statute the cause of partial or total incapacity may spring from and be attributable to the injury just as much where undeveloped and dangerous physical conditions are set in motion producing such result as where it follows directly from dislocations, or dismemberments, or from internal organic changes capable of being exactly located. *Madden's Case*, 222 Mass. 487, 111 N. E. 379.

Recovery of compensation by a claimant, continued the Florida court, is not conditioned on good or perfect health. The statute here considered does not require a health certificate or require the workman to be free from disease at the time he was employed or injured. It is reasonable to assume that a workman has physical infirmities and takes them, if any, with him to his employment. The employer accepts the workman in such physical condition as he finds him and assumes the risk of a disease condition aggravated by injury. Compensation is not made to depend on the condition of health of the workman but on an injury which is a hazard of employment. The controlling principle of law is succinctly expressed by Schneider on Workmen's Compensation Law, ed. 2, vol. 1, p. 517, par. 138, viz:

Aggravation of Preexisting Condition—"Likewise the courts, consistent with the theory of workmen's compensation acts, hold with practical uniformity that, where an employee afflicted with disease receives a personal injury under such circumstances as that he might have appealed to the act for relief on account of the injury had there been no disease involved, but the disease as it in fact exists is by the injury materially aggravated or accelerated, resulting in disability or death earlier than

would have otherwise occurred and the disability or death does not result from the disease alone progressing naturally, as it would have done under ordinary conditions, but the injury aggravating and accelerating its progress, materially contributes to hasten its culmination in disability or death there may be an award under the compensation acts."

The Supreme Court accordingly, in effect, ordered an award of compensation in favor of the workman.—*Davis v. Arlt Const. Co.*, 18 So. (2d) 255 (Fla., 1944).

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the Examining Boards in Specialties were published in THE JOURNAL, Sept. 2, page 49.

BOARDS OF MEDICAL EXAMINERS

- ALABAMA: Montgomery, Oct. 24-26. Sec. Dr. B. F. Austin, 510 Dexter Ave., Montgomery.
- ARIZONA: Phoenix, Oct. 3-4. Sec., Dr. J. H. Patterson, 526 Security Bldg., Phoenix.
- ARKANSAS: Little Rock, Nov. 9-10. Sec., Dr. D. L. Owens, Harrison.
- DELAWARE: Dover, Oct. 10-12. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.
- DISTRICT OF COLUMBIA: Washington, November. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.
- IDaho: Boise, Jan. 8-11. Dir., Bureau of Occupational Licensure, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.
- ILLINOIS: Chicago, Oct. 10-12. Supt. of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.
- INDIANA: Indianapolis, Jan. 3-5. Exec. Sec., Board of Medical Registration and Examination, Miss Ruth V. Kirk, 301 State House, Indianapolis 4.
- IOWA: Iowa City, Sept. 25-27. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.
- KANSAS: Nov. 2-3. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.
- KENTUCKY: Louisville, Sept. 11-13. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville.
- MARYLAND: Homoeopathic, Baltimore, Dec. 1-3. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.
- MICHIGAN: Detroit, Sept. 25-27. Sec., Board of Registration in Medicine, Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.
- MISSISSIPPI: Jackson, Oct. 16-17. Asst. Sec., Dr. R. N. Whitfield, Jackson.
- MISSOURI: St. Louis, Sept. 18-20. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.
- MONTANA: Helena, Oct. 2-4. Sec., Dr. O. G. Klein, First Natl Bank Bldg., Helena.
- NEBRASKA: Omaha, Sept. 26-28. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.
- NEW HAMPSHIRE: Concord, Sept. 14-15. Sec., Board of Registration in Medicine, Dr. D. G. Smith, 77 Main St., Nashua.
- NEW MEXICO: Santa Fe, Oct. 9-10. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.
- NORTH CAROLINA: Raleigh, Sept. 11-12. Sec., Dr. W. D. James, Hamlet.
- NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williams, 414 S. 3rd St., Grand Forks.
- OHIO: Examination Columbus, Sept. 26-29. Endorsement Columbus Oct. 3. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.
- OKLAHOMA: Oklahoma City, Sept. 16. Sec., Dr. J. D. Osborn, Jr., Frederick.
- SOUTH CAROLINA: Charleston, Sept. 11-13. Sec., Dr. N. B. Heward, 1529 Blandina St., Columbia.
- SOUTH DAKOTA: Pierre, Jan. 16-17. Sec., Medical Licensure, State Board of Health, Dr. G. Cottam, Pierre.
- TENNESSEE: Memphis and Nashville, Sept. 20-22. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis 3.
- TEXAS: Dallas, Nov. 15-17 and Dec. 19-21. Sec., Dr. T. J. Croue, 918-20 Texas Bank Bldg., Dallas 2.
- UTAH: Salt Lake City, Sept. 13-15. Asst. Dir., Department of Registration, Miss Rena B. Loomis, 324 State Capitol Bldg., Salt Lake City.
- VERMONT: Burlington, Sept. 12-14. Sec., Dr. F. J. Lathiss, Richfield.
- VIRGINIA: Richmond, Sept. 19-22. Sec., Dr. J. W. Preston, 30 1/2 Franklin Rd., Roanoke.
- WEST VIRGINIA: Charleston, Oct. 2-4. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.
- WISCONSIN: Endorsement Milwaukee, Sept. 18-19. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

- CONNECTICUT: New Haven, Oct. 14. Address. State Board of Health Arts, 250 Church Street, New Haven 10.
- DISTRICT OF COLUMBIA: Washington, Oct. 23-24. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.
- FLORIDA: Gainesville, Nov. 4. Final date for filing application is Oct. 20. Sec., Dr. J. F. Conn, John B. Stetson University, Deland.
- IOWA: Des Moines, Oct. 10. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.
- MICHIGAN: Ann Arbor and Detroit, Oct. 13-14. Sec., Miss Elise LeBeau, 101 N. Walnut St., Lansing.
- NEBRASKA: Omaha, Oct. 3-4. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.
- NEW MEXICO: Santa Fe, Feb. 12. Sec., Miss Marion M. Phee, State Capitol, Santa Fe.
- OREGON: Portland, Nov. 4. Sec., Mr. C. D. Byrne, University of Oregon, Eugene.
- TENNESSEE: Memphis and Nashville, Sept. 25-26. Sec., Dr. O. W. Haman, 874 University Ave., Memphis.
- WISCONSIN: Madison, Sept. 23. Sec., Prof. R. N. Burr, 132 W. Wisconsin Ave., Milwaukee 3.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Archives of Dermatology and Syphilology, Chicago

49:389-478 (June) 1944

Keratitis Blepharorrhagia Without Gonorrhea (Reiter's Disease?). W. F. Lever and G. M. Crawford.—p. 389.

Chromoblastomycosis: Report of Case from Continental United States and Discussion of Classification of Causative Fungus. C. H. Binford, G. Hess and C. W. Emmons.—p. 398.

*Intensive Ambulatory Therapy of Syphilis: Thirty Day Mapharsen Technic. S. Goldblatt.—p. 403.

Ulcerative Diphtheria of Skin: Sporadic and Epidemic Types Observed in Haifa, Palestine. S. Gill.—p. 408.

*Hereditary Ectodermal Dysplasia: Report of Case, with Experimental Study. Z. Felsner.—p. 410.

Localized Myxedema in Association with Hyperthyroidism. J. C. Amersbach and B. Kane.—p. 415.

Fixed Erythema Due to Sulfanilamide with Gradually Lessening Sensitivity. A. Dostrovski and F. Sagher.—p. 418.

Coal Tar in Dermatologic Preparations. J. G. Downing, L. M. Ohmart and G. Di Cicco.—p. 421.

Bullous Lichen. Sclerosus et Atrophicus: Its Relation to Bullous Scleroderma. C. R. Anderson.—p. 423.

Cutaneous Absorption: II. Value of Petrolatum, Anhydrous Wool Fat and Other Bases in Percutaneous Absorption of Topically Applied Cottonseed Allergen. A. Walzer and S. S. Sack.—p. 427.

*Contact Dermatitis from Cold Permanent Waving. J. B. Howell.—p. 432.

Cutaneous Leishmaniasis (Oriental Sore): I. Time Required for Development of Immunity After Vaccination. D. A. Berberian.—p. 433.

Thirty Day Mapharsen Technic in Syphilis.—Goldblatt

gave 60 mg. of mapharsen intravenously dissolved in 5 cc. of sterile distilled water for thirty successive days. A total of 1,800 mg. of mapharsen was thus administered without adjuvant therapy. An unselected group of 107 patients with syphilis of all types, was treated by this intensive consecutive thirty day mapharsen method. The serologic reactions, which were positive in 81 per cent of the total group before treatment, showed a decided and continuing reduction in titer. On termination of the treatment positive serologic reactions were noted in 55 per cent, two months later in 35 per cent. Follow-up investigations from three to six months after the treatment indicated that the reactions of 20 per cent remained positive. No significant changes were observed in the formed or chemical constituents of the blood. Electrocardiographic examination revealed no deleterious effect on cardiac function, either immediately or remotely. Roentgenographic examination of the cardiovascular system indicated no progressive or toxic sequelae. Retreatment was carried out for the 3 patients with serologic relapse. Two with severe meningovascular involvement were subjected to fifteen attacks of induced fever concurrent with the hyperintensive therapy without untoward reaction. It was found possible to administer sulfonamide compounds for the treatment of intercurrent disease without interrupting the intensive mapharsen therapy. Complete healing of all the lesions of infectious syphilis required an average of ten days. A gain in weight and increased appetite and feeling of well-being were noted in the large majority of patients. No mucocutaneous relapse or neurorecurrence developed. This therapy appears to be nontoxic. Hospitalization is not required; the treatment is inexpensive and does not disrupt the economic life of the patient.

Hereditary Ectodermal Dysplasia.—Felsner shows that the inheritance of hereditary ectodermal dysplasia is not as clearcut as was believed. The history of his patient with this disorder revealed sex linked inheritance in the family tree, with male patients and female conductors. Eccrine glands were practically absent on the face and abdomen. Their number on the extremities was decreased to 5 to 7 per cent of the normal

number. Apocrine sweat glands were abundant in the axillas, on the upper part of the chest and on the perimamillary areas. The patient's insensible perspiration, at rest in a room temperature of 73 F., was normal. Atropine sulfate in a dose of 0.5 mg. subcutaneously did not change it. The intradermal injection of a 1:100 solution of acetylcholine bromide produced only a few isolated spots of sweating on the patient's forearm, as contrasted with the decided response of a normal control subject. In the heat chamber the body temperature of the patient rose rapidly whereas the body temperature of normal persons did not change under similar conditions. The term "hypohidrotic" is suggested as being more accurate than "anhidrotic" for the described type of ectodermal dysplasia. The absence of eccrine glands is not necessarily complete in spite of hyperthermia at high external temperatures.

Contact Dermatitis from Cold Permanent Waving.—

Howell reports that a woman experienced burning and stinging sensations over the sides of her neck, face and ears the afternoon after she had received her first cold permanent wave. The next morning she noted redness of the areas. When she was in the office the following day a mild dermatitis venenata type of eruption, consisting of slight swelling, diffuse redness, pruritus and in some areas fine vesiculation, was noted. The dermatitis reached its maximum extent within seventy-two hours and subsided by the end of the sixth day. Patch tests on 3 normal controls with 1 per cent concentrations of the shampoo, the preliminary lotion, the waving compound, the neutralizing solution and mixtures of these chemicals failed to evoke any reactions. Contact tests were then applied to the forearm of the patient one month after the dermatitis of her face, neck and ears had healed. On two different occasions a positive reaction followed within twenty-four hours the application of the preliminary lotion. No reactions were observed following contact tests with the waving compound, the neutralizing liquid or the shampoo. This case is an example of an eczematous contact dermatitis following within twenty-four hours a "cold permanent wave." Unquestionably this patient was already sensitive to some ingredient in the preliminary lotion, since patch tests elicited positive reactions on two different occasions. Sensitization due to previous contacts with the allergen present in the preliminary solution or a closely related chemical took place without the patient's knowledge. Reexposure to this substance when she received a cold permanent wave precipitated the allergic response.

Archives of Otolaryngology, Chicago

39:465-572 (June) 1944

Four Decades of Nasal Allergy. L. Richards.—p. 465.

Sarcoid of Nose. R. Fletcher.—p. 470.

pt of Nasal Secretions in Situ in Atrophic Rhinitis: Its Implications. N. D. Fabricant.—p. 474.

Reconstruction of Deformed Nasal Septum: Critical Evaluation of Orthodox Submucous Resection from an Anatomophysiologic Standpoint. M. S. Ernsner.—p. 476.

Osteomyelitis of Frontal Bone. L. A. Brown.—p. 485.

Recent Progress in Management of Acute Suppuration of Middle Ear. J. R. Lindsay.—p. 492.

Head Noises in Normal and in Disordered Ears: Significance, Measurement, Differentiation and Treatment. E. P. Fowler.—p. 498.

Atmospheric Pressures in Nasal Fossa, Maxillary Sinus and Trachea. E. Simon.—p. 504.

Physiology of Nose from Standpoint of Plastic Surgeon. A. W. Proetz.—p. 514.

Role of Plastic Surgery in Field of Otolaryngology. S. Gomon.—p. 518.

Report of Isograft Transplants in Identical Twins. A. Schattner.—p. 521.

*Injection of Tympanum for Chronic Conductive Deafness and Associated Tinnitus Aurium: Preliminary Report on Use of Ethylmorphine Hydrochloride. B. C. Trowbridge.—p. 523.

Perforation of Tuberculous Lymph Nodes into Trachea and Bronchi. O. Auerbach.—p. 527.

Adenoma of Ceruminous Glands. H. J. Adler and I. Sommer.—p. 533.

Use of Solution of Posterior Pituitary of Twice U. S. P. Concentration for Hemorrhage Following Tonsillectomy or Adenoidectomy. J. W. McLaurin.—p. 536.

Contributions to Plastic Surgery During 1943. L. A. Peer.—p. 537.

Injection of Tympanum for Chronic Conductive Deafness and Tinnitus Aurium.—According to Trowbridge, injection of the tympanum as a method of treatment in deafness was first suggested and used by Gray in 1934 at the Middlesex Hospital in London. Gray advocated this therapy for otosclerosis and employed thyroxin as the medium of injection.

Results with thyroxin therapy have not been altogether encouraging. Trowbridge sought an agent which would incite a sterile inflammation with subsequent absorption of the scar tissue, cicatricial bands and adhesions that interfere with the normal functioning of the conductive mechanism. The therapeutic value of ethylmorphine hydrochloride in removing pupillary exudates and in absorbing interstitial corneal deposits has long been known. It acts as a vasodilator and lymphagogue, stimulating the vascular and lymphatic circulation of the eye and producing dilatation of these vessels. The drug produces analgesia, which counteracts the discomfort of the injection and of the subsequent inflammation. Improvement in hearing occurred in 18 of 22 patients selected for this type of therapy. In 4 patients no improvement was obtained. Lessening of the tinnitus occurred in 6 and loss of tinnitus in 3 of 9 patients with associated tinnitus aurium. All of the patients were ambulatory and continued their usual daily routines without interference from the injections. Secondary reactions were negligible. Only transient vertigo occurred in several cases, disappearing within fifteen minutes after the injection. The improvement in hearing was demonstrated by audiometric studies as well as by the testimony of the patients themselves.

Connecticut State Medical Journal, Hartford

8:343-406 (June) 1944

- Medical Practice and Hospital Service. A. M. Schwittalla.—p. 348.
Carcinoma of Lip at New Haven Hospital, 1921 to 1940, Inclusive. E. A. Lawrence and A. W. Oughterson.—p. 353.
Some Fallacies and Deficiencies in Problem of Heart Disease. W. J. Bruckner.—p. 357.
Purposes of Woman's Auxiliary. Mrs. E. J. Carey.—p. 360.

8:407-482 (July) 1944

- Comment on Experimental Gastric Cancer. G. M. Smith.—p. 409.
Treatment of Thoracic Trauma. G. E. Lindskog.—p. 414.
Bacillary Dysentery. K. M. Wheeler.—p. 419.
Osteomyelitis of Skull. B. S. Brody.—p. 421.
How Hospitals Are Attempting to Meet Increasing Demands for Hospital Service. O. H. Bartine.—p. 423.
Report on Progress and Activities of the Society. J. R. Miller.—p. 426.

Hawaii Medical Journal, Honolulu

3:159-198 (March-April) 1944

- Anesthesia in Small Hospital: Review of Methods Used for Period of One Year. M. A. Brennecke.—p. 159.
Primary Carcinoma of Liver with Hemorrhage: Report of Case. C. T. Young.—p. 161.
Rupture of Uterus Following Previous Cesarean Section: Review and Report of 2 Cases. C. F. Chang and W. K. Chang.—p. 164.

Iowa State Medical Society Journal, Des Moines

34:225-268 (June) 1944

- Head Injuries. A. Ver Bruggen.—p. 225.
Continuous Caudal Anesthesia. D. Wall.—p. 236.
Mental Hygiene Program for Iowa. M. Herman.—p. 238.
Clinical Diagnosis of Pernicious Anemia. F. P. McNamara.—p. 242.

34:269-340 (July) 1944

- Postwar Industrial Medical Program. C. D. Selby.—p. 269.
Military Management of Allergic Diseases. S. W. French and L. J. Halpin.—p. 272.
Hard of Hearing and Hearing Aids. C. C. Walker.—p. 274.
Mixed Tumor of Parotid Gland. A. B. Nesler.—p. 276.

Journal of Experimental Medicine, New York

79:559-680 (June) 1944

- Experimental Epidemiology of Tuberculosis: Prevention of Natural Air Borne Contagion of Tuberculosis in Rabbits by Ultraviolet Irradiation. M. B. Lurie, with collaboration of Helen Tomlinson and S. Abramson.—p. 559.
Recoverability of Virus from Papillomas Produced Therewith in Domestic Rabbits. W. F. Friedewald and J. G. Kidd.—p. 591.
Amino Acid Mixtures Effective Parenterally for Long Continued Plasma Protein Production: Casein Digests Compared. S. C. Madden, R. R. Woods, F. W. Shull and G. H. Whipple.—p. 607.
Methionine Protects Against Mapharsen Liver Injury in Protein Depleted Dogs. J. P. B. Goodell, P. C. Hanson and W. B. Hawkins.—p. 625.
Qualitative Differences in Antigenic Composition of Influenza A Virus Strains. W. F. Friedewald.—p. 633.
Studies on Etiology of Primary Atypical Pneumonia: Filtrable Agent Transmissible to Cotton Rats, Hamsters and Chick Embryos. M. D. Eaton, G. Meiklejohn and W. van Herick.—p. 649.

Journal of National Malaria Society, Tallahassee, Fla.

3:79-154 (June) 1944

- *Malaria Mortality and Morbidity in United States for Year 1942. E. C. Faust.—p. 79.
Recent Research in Prophylaxis and Treatment of Malaria: Report for 1942-1943. H. C. Clark.—p. 85.
Recent Research in Avian and Simian Malaria. R. I. Hewitt.—p. 93.
Malaria Prevention Activities of State Boards of Health, 1943. F. J. Underwood.—p. 111.
Introduction of Tropical Diseases Other Than Malaria Into United States After the War. W. A. Sawyer.—p. 115.
Spleen Measurement in Malaria. L. W. Hackett.—p. 121.
Notes on Construction and Use of Stable Traps for Mosquito Studies. M. Bates.—p. 135.

Malaria Mortality and Morbidity in 1942.—Malaria mortality data by states and counties for the United States in 1942 show a continued improvement over previous years. Only eight states had a rate of 1.0 or more per hundred thousand and only four counties had a rate of 25.0 or more. The malaria morbidity data, as reported by bureaus of vital statistics of several states, continue to be unreliable when tested against the expected ratios of deaths to cases. In mildly endemic territories such as the malarious areas of the United States have been it is estimated that there were between 236,000 and 590,000 cases in 1942 as compared with 278,000 to 695,000 in 1941.

Journal of Nervous and Mental Disease, New York

99:889-1012 (June) 1944

- Prevention of Subconvulsive Reactions in Convulsive Therapy (Psychoses). Esther S. Ziskind and E. Ziskind.—p. 889.
Cholinergic Sensitivity. R. Altschul.—p. 895.
Myotonic Dystrophy. B. B. Mongillo and M. Serog.—p. 906.
"Shock" Therapies. G. H. Alexander.—p. 922.
Suggestions for New Therapy in Dementia Precox. E. Lowenstein.—p. 925.
Diethylstilbestrol in Management of Psychopathological States in Male. R. M. Foote.—p. 928.
Growth Concept of Nervous Integration: IV. On Etiology and Treatment of Renal Hypertension. D. E. Schneider.—p. 936.
Homosexuality, Transvestism and Psychosis. S. Lieberman.—p. 945.
The "Placing-Into-Mouth" and Coprophagic Habits. S. Arieti.—p. 95.

Journal of Neurosurgery, Springfield, Ill.

1:163-226 (May) 1944

- Neurosurgical Head Rest for Use in Army and Navy Hospitals. W. M. Craig.—p. 163.
Traumatic Pneumocephalus with Spontaneous Ventriculogram: Report on Case. A. Kaplan.—p. 166.
*Studies on Fibrin Foam as Hemostatic Agent in Neurosurgery, with Special Reference to Its Comparison with Muscle. F. D. Ingraham, O. T. Bailey and F. E. Nulsen.—p. 171.
Experimental Traumatic Cerebral Cysts in Rabbit. M. A. Falcone and Dorothy S. Russell.—p. 182.
Mechanics of Trauma, with Special Reference to Herniation of Cerebral Tissue. A. H. S. Holbourn.—p. 190.
Intracranial Dural Cyst, with Report of Case. W. Haymaker and M. E. Foster Jr.—p. 211.
*Sutureless Reunion of Severed Nerves with Elastic Cuffs of Tantalum. P. Weiss.—p. 219.

Fibrin Foam as Hemostatic Agent in Neurosurgery.—Ingraham and his associates show that in the course of fractionation of human blood plasma large quantities of human fibrinogen and thrombin become available. Bering has prepared from these materials a substance designated "fibrin foam." The product is composed of a porous mass of fibrillar fibrin with macroscopic air spaces. When the foam is moistened, fluid rapidly enters the air spaces. It then becomes rubbery and shrinks to a certain extent. If the moistening agent is a solution of human thrombin, the foam becomes an effective hemostatic agent. While the fibrin foam and thrombin may be used in many forms of surgery, the authors' experiences are limited to neurosurgery. In this field it has proved the most satisfactory hemostatic agent available. For use in the operating room two bottles are provided. One contains sterile fibrin foam and the other thrombin in the dry state. Thrombin is dissolved in 30 cc. of sterile isotonic solution of sodium chloride. Pieces of the fibrin foam are then placed in the thrombin solution, after which the material is ready for use. For application to bleeding surfaces a piece of appropriate size is cut and held firmly against the tissue. This is usually best accomplished by covering it with a cotton patie and applying suction for a moment. When the patie is removed, the fibrin foam remains adherent to the tissue surface. The authors found that fibrin foam with

thrombin promptly controls bleeding from oozing surfaces, from large veins and from the dural sinuses. Muscle as a hemostatic agent is less adaptable than fibrin foam and causes considerably more tissue reaction. Fibrin foam has several advantages over soluble cellulose, though the tissue reaction to the two substances is similar. Fibrin foam has been applied at more than one operation in 34 cases without change in tissue response or other damage. The usefulness of fibrin foam is enhanced by the fact that it may be molded to the contour of the bleeding surface before or after application, that it retains that contour after pressure is released and that it adheres quickly and permanently to the bleeding surface.

Sutureless Reunion of Nerves with Elastic Cuffs of Tantalum.—Weiss describes a method by which tantalum foil can be fashioned into resilient self-sealing tubes, which may be used as cuffs for the sutureless linking of severed nerve stumps in the manner previously described for arterial sleeves. Preliminary observations on monkey and cat nerves joined by this method have demonstrated that excellent reunion between the stumps with the properties required for optimal nerve regeneration may be achieved if the sleeves have been suitably shaped and properly handled.

Journal of Thoracic Surgery, St. Louis

13:169-270 (June) 1944

- Dermoid Cysts and Teratomas of Mediastinum: Review. N. L. Rusby.—p. 169.
Closed Intrapleural Pneumolysis. J. Goorwitch.—p. 223.
Surgical Management of Residual Tuberculous Cavities Following Primary Thoracoplasty. A. R. Judd.—p. 249.
Pneumolysis Sponge Carrier and Dissector. J. S. Conant.—p. 267.

Journal of Urology, Baltimore

51:447-562 (May) 1944

- Bilateral Nephrolithiasis in Horseshoe Kidney. F. Farman.—p. 447.
Duplication of Kidney and Ureter; Statistical Study of 230 New Cases. E. F. Nation.—p. 456.
Congenital Renal Hypoplasia Associated with Hypertension: Report of 2 Cases. D. R. Higbee.—p. 466.
Case of Polycystic Kidney Disease with Unusual Features. R. Schwartz.—p. 476.
Two Stage Nephrectomy. G. V. Caughlan and T. D. Boler.—p. 481.
Renal Surgery as Cause of Renal Ischemia. W. G. Hayward.—p. 486.
Giant Hydronephrosis Following Generalized Trauma. M. Meltzer.—p. 491.
*Carcinoma of Bladder: An Improved Technic for Cystoscopic Implantation of Radium Element. T. D. Moore.—p. 496.
Rhabdomyosarcoma of Urinary Bladder: Clinicopathologic Case Report, with Review of Literature, Including Tabulation of Rhabdomyosarcoma of Prostate. E. N. Khoury and F. D. Speer.—p. 505.
Extramural Rhabdomyosarcoma of Neck of Urinary Bladder. E. F. Hirsch and G. W. Gasser.—p. 517.
Interstitial Cystitis: Treatment with Silver Nitrate. T. L. Pool and H. F. Rives.—p. 520.
My Personal Opinions of Interstitial Cystitis (Hunner's Ulcer). T. L. Howard.—p. 526.
Sympathetic Innervation of Detrusor Muscle. A. Kuntz and G. Saccamanno.—p. 535.
Primary Fibrosarcoma of Penis: Review of Literature and Report of Case. C. A. Wattenberg.—p. 543.
Hemangioma of Testis. A. H. Kleiman.—p. 548.
Torsion of Spermatic Cord. E. E. Ewert and H. A. Hoffman.—p. 551.

Cystoscopic Implantation of Radium Element in Carcinoma of Bladder.—Moore states that cases suitable for closed methods of treatment, with or without the use of radium, must be selected with care. They comprise chiefly tumors of a low degree of malignancy, and occasionally small or early tumors of grades 3 and 4. In a series of 96 cases of carcinoma of the bladder, 16 were inoperable and treatment was refused in 10. Of the 70 patients who underwent treatment, 36 were treated by closed methods and 34 were subjected to open operation. If cystoscopic implantation of radium is contemplated, the tumor should be in a location favorable for a good view and for attack through a direct cystoscope, which would include tumors involving half of the lateral walls. If the growth is in the vesical dome, the anterior wall or anterior half of the lateral walls this method is unsuitable. Radium element should be employed cystoscopically in preference to radon seeds because the cystoscopic implantation of small platinum needles by the author's method is technically no more difficult than the implantation of radon and on expiration of the allotted time of radiation the needles

are removed. Radon usually is left in place and becomes a permanent foreign body, which may be undesirable in the presence of infection, especially in the region of the trigone; in charity services and in indigent patients in private practice the expense of gold radon seeds may be prohibitive. The author treated 11 patients by cystoscopic implantation of radium element. Of the 5 who have died the survival varied between six months and six years. Among the 6 still surviving, some have been treated quite recently. The neoplasms were mostly of grades 2 and 3. The chief indication for irradiation in bladder carcinoma has been advanced age. It is generally agreed that the avoidance of open surgery in such a group is desirable.

Kansas Medical Society Journal, Topeka

45:161-196 (May) 1944

- Sternberg and Fort Harker Cholera Epidemic of 1867. J. M. Schneek.—p. 161.
Possible Transmission Factors in Poliomyelitis. O. S. Walters.—p. 163.
Pathologic Physiology of Hypertension. G. A. Walker.—p. 167.

45:197-232 (June) 1944

- Management of Acute Infectious Diseases in Childhood. A. L. Hoyne.—p. 197.
Staphylococcus Osteomyelitis: Case Report. F. L. Feireabend.—p. 200.
Sulfathiazole in Gonorrhea. B. M. Marshall.—p. 201.

Military Surgeon, Washington, D. C.

94:325-398 (June) 1944

- Sanitary Problems of Tropical Advanced Base. L. W. Johnson.—p. 325.
Orthopedic Surgery in Treatment of Wounds. A. E. Porritt.—p. 335.
Surgery in Desert Warfare. P. B. Ascroft.—p. 337.
*Use of Sulfathiazole as Prophylactic Agent. J. O. Gooch and A. L. Gorby.—p. 339.
Medical Examination at Armed Forces Induction Station: Observations of Medical Examining Physician. F. K. Herpel.—p. 345.
Clinical Review of Schistosomiasis with Presentation of an Interesting Case. R. R. Pliskin.—p. 351.
Vincent's Infection. H. L. Malter.—p. 358.
Radical Operation with Plastic Closure for Cure of Ingrowing Nails. L. C. Bennett.—p. 361.
Clinical Observations on Dengue Fever: Report of 100 Cases. J. S. Diasio and F. MacD. Richardson.—p. 365.
Value of Sedimentation Rate Determinations in Management of Primary Atypical Pneumonia, Etiology Unknown. S. A. Wolfson.—p. 370.
Traction of Soft Tissues: New Method Following Amputation. J. L. Magrath.—p. 373.
Field Device for Hand Washing. H. Greenbaum.—p. 374.

Sulfathiazole Prophylaxis for Gonorrhea.—Gooch and Gorby describe three different plans of sulfathiazole prophylaxis in units with venereal disease rates in excess of 100 per thousand a year. The use of regularly established prophylactic stations (these stations do not administer sulfathiazole) as soon as possible after contact was encouraged, directing that sulfathiazole should be considered as an adjunct to such measures rather than supplanting them. It was emphasized that sulfathiazole in no way protected against syphilis and that syphilis prophylactic measures should not be neglected. At the time the sulfathiazole prophylaxis was put into effect the annual gonorrhea rate of the units affected averaged 170 per thousand. After two and one-half months of application the annual rate was reduced to an average of 70 per thousand. The rate as it now stands is due to cases contracted on furloughs, which often means that the men are away from the organization for fifteen days. They frequently return from furlough with acute gonorrhea. Aside from the method in use with those units exhibiting high venereal disease rates, different methods were used to establish the most efficacious dosage, the smallest effective dose, the proper timing of the dosage and to compare sulfathiazole gonorrhea prophylaxis with the standardized venereal disease prophylactic method using soap, five minute urethral instillation of 2 per cent solution of strong protein silver and ointment of mild mercurous chloride. After describing the prophylaxis used in four different groups the author says that in those using sulfathiazole the drug was entirely administered after the exposure except in group 4. In this group 2 Gm. of sulfathiazole was given as the man left his company area on pass and when he returned, the drug being given before and after exposure. During the period covered by this report there was a reduction in the venereal disease rate from gonorrhea alone from an approximate annual figure of 16 to 11 per thousand. The authors concluded that (1) sulfathiazole is an effective gonor-

rheal prophylactic agent, (2) the average individual prefers the sulfathiazole type of prophylaxis over the urethral instillation method, (3) sulfathiazole gonorrheal prophylaxis is effective for a longer period following exposure, (4) in prophylactic dosage toxicity and sensitivity reactions to the drug are negligible, (5) a total dose of 2 Gm. of sulfathiazole appears as effective as twice that amount, (6) there was a concurrent lowering of the common respiratory disease rate in those units placed on a mandatory sulfathiazole gonorrheal prophylaxis regimen, i. e. those units with high venereal disease rates, and (7) there has been a concurrent lowering of the syphilis rate as a result of increase in the number of prophylactic administrations.

Minnesota Medicine, St. Paul

27:337-432 (May) 1944

Social and Economic Trends in Relation to Medical Practice. W. L. Burnap.—p. 355.

Postwar Planning for Medicine. E. J. Carey.—p. 359.

Treatment of War Wounds of Extremities. C. A. Caspers.—p. 364.

Challenge to Psychiatry in Postwar Period. E. K. Clarke.—p. 367.

27:433-512 (June) 1944

Manpower Problems in Professional Fields. D. Bjornaraa.—p. 453.

Clinical Use of Dicumarol: Report of Cases. E. E. Eckstam.—p. 455.

Hand Infections. R. F. Hedin.—p. 459.

Crippled Appendix—Pediatric Problem. W. R. Shannon.—p. 466.

Isolation from Milk Supplies of Specific Types of Green Producing

(Alpha) Streptococci and Their Thermal Death Point in Milk. E. C. Rosenow.—p. 469.

New England Journal of Medicine, Boston

230:685-720 (June 8) 1944

Medical Service in Industry. D. O'Hara.—p. 685.

Clinical Significance of Bacteriuria in Patients with Spinal Cord

Injuries. D. Badal, D. Munro and M. E. Lamb.—p. 688.

Tuberculosis of Lower Lobe. E. Z. Ossen.—p. 693.

Parathyroid Glands and Parathormone. A. Pope and J. C. Aub.—p. 698.

230:721-748 (June 15) 1944

Treatment of Anuria. C. W. Styron and W. F. Leadbetter.—p. 721.

Dr. Saul Tchernichovsky, 1875-1943: Hebrew Medical Poet Laureate.

H. A. Savitz.—p. 728.

New Biologic Concepts Derived from Research on Sulfonamide Drugs.

B. D. Davis.—p. 734.

New Orleans Medical and Surgical Journal

96:551-610 (June) 1944

President's Address: Progress of Medicine and Surgery in United States in Last Fifty Years and What the Future Holds for It Under the Wagner-Murray-Dingell Bill. C. C. deGravelles.—p. 551.

Memorial Address. J. Q. Graves.—p. 556.

Peace and Health. R. Fitz.—p. 557.

*Ephedrine Sulfate in Treatment of Nocturnal Enuresis. W. E. Kittredge and H. G. Brown.—p. 562.

Adenomya of Gallbladder: Report of Multiple Papillary Adenomyoma in 15 Year Old Boy. G. McHardy and D. Browne.—p. 567.

*Incidence of Peptic Ulcer. M. Patterson.—p. 570.

Ephedrine Sulfate in Nocturnal Enuresis.—Parkhurst suggested in 1930 the use of ephedrine in incontinence of urine. Kittredge and Brown used the drug for the control of enuresis in 25 children who were chronic bed wetters. Twenty-three of these immediately became continent and remained so as long as the drug was administered. It was given in a single dose of 34 grain (50 mg.) each night at bedtime, and no other measures were taken to influence the bed wetting habit. The drug was continued in each case for two weeks and then withdrawn. It was then noted that enuresis returned in 11 of the 23 children; the other 12 remained well. The 2 who were not influenced were incorrigible children of low mentality. Each case is first carefully studied to eliminate organic pathologic conditions which might cause frequency of urination stimulating enuresis. It is always necessary to eliminate the possibility of infection in the urine, mechanical obstruction to the emptying of the bladder with resultant retention, or neurologic defect which would interfere with normal function of the bladder. The drug is recommended because of its ease of administration, absence of disagreeable reactions and excellent results.

Incidence of Peptic Ulcer.—Patterson states that statistical reports from various countries reveal a manifest variability in the incidence of peptic ulcer from country to country but that

in America approximately 12 per cent of all persons have peptic ulcer at some time in their lives. The ratio of gastric to duodenal ulcer is extremely variable, but among patients seen in this country duodenal lesions predominate about 4 to 1. The period of life from the thirtieth to the sixtieth year with a peak in the middle age years (35 to 50) is the most frequent period for peptic ulcer, and duodenal ulcer makes its appearance earlier in life than the gastric ulcer. Peptic ulcer is predominantly a lesion found in the male. This predominance is more obvious in cases of duodenal ulcer than of gastric ulcer. The main evidence, though slight, points toward an endocrine basis. Hemorrhage is the most frequent complication, but perforation is the more serious. Opinions as to the role of occupation in peptic ulcer are contradictory. The impression that the disease is most prevalent among those who lead lives entailing great nervous strain and responsibility awaits proof. Draper's contention that there is a body type peculiar to peptic ulcer is unreliable. Some authors obtained a positive family history in a large percentage of ulcer patients. Peptic ulcer is of importance in the present national crisis. Dyspepsia is the number one medical problem in the armed forces, and reports show that the incidence of ulcer is 30 per cent or over, with the majority in the duodenum. The author thinks that the high incidence of peptic ulcer in the armed forces is not a result of the war but that the war called attention to the numerous cases which existed but were not recognized.

New York State Journal of Medicine, New York

44:1169-1280 (June 1) 1944

Prolonged Intravenous Pentothal Sodium Anesthesia, Especially with Reference to Its Application to Military Surgery. B. A. Greene.—p. 1205.

Inhalation Therapy Using Mineral Waters and Medicated Oils. W. S.

McClellan, with technical assistance of Margaret Rogers.—p. 1214.

Antepartum Necrosis of Anterior Lobe of Pituitary Gland. J. S. Taylor

and E. F. Shea.—p. 1223.

*Preventive Aspects of Coronary Disease and Myocardial Infarction. M. Plotz.—p. 1227.

Cesarean Section: Advantages and Disadvantages of Present Day Types.

J. P. Marr.—p. 1230.

Preventive Aspects of Coronary Disease.—Plotz thinks that preventive measures are possible for a certain number of patients with coronary disease or myocardial infarction. First there is the patient who has already had one attack of coronary thrombosis. Next there is the man with angina pectoris. Next there are middle aged and aged persons with electrocardiographic evidence of heart damage without symptoms. Given certain conditions, their coronary arteries will fail. Somewhat less vulnerable but still requiring special vigilance are patients with hypertension, diabetes, myxedema, polycythemia or elevated blood cholesterol from any cause. Coronary thrombosis practically never occurs in an undamaged artery. It is preceded by an atheroma. Terrifying pain, shock and changes in the cardiogram are only the final act in coronary thrombosis. Preceding this there may be a prodromal stage of precordial pain resembling coronary pain. It is like a prolonged, atypical attack of angina pectoris and is a reflection of reduced coronary circulation and anoxia of the heart. If a patient falls into one of the vulnerable categories such an attack should lead one to suspect an impending coronary thrombosis. A man who suddenly develops angina pectoris for the first time should be put in the same category. These patients should be treated as though they had a cardiac infarction. Bed rest for five to fourteen days and use of papaverine to increase the pulmonary circulation are essential. Patients should be warned against the use of glyceryl trinitrate at this stage. If it does not relieve pain promptly it should not be used again, because the repeated use lowers the blood pressure and increases the possibility of infarction. Sharp and prolonged reduction of blood pressure may be fatal to a patient of the vulnerable classes. Therefore he must be protected against such events as shocking operations, spinal anesthetics, which lower the blood pressure, and severe hemorrhages. In this connection the author cites several illustrative cases and says that for the past two years he has employed slow plasma transfusion for those patients whose systolic blood pressure has fallen below 90. He feels that several lives have been saved by preventing the coronary head pressure from falling too low.

North Carolina Medical Journal, Winston-Salem

5:173-216 (May) 1944

- Challenge to the Doctors of North Carolina. J. W. Vernon.—p. 173.
Interstitial Nephritis: Case Report. E. S. Faison.—p. 179.
Streptococcal Disease in Infancy and Childhood. E. V. Turner.—p. 182.
Brucellosis. C. G. Reid.—p. 186.
Management of Occipitoposterior Position. T. L. Lee.—p. 189.
Thumbnail Sketches of Eminent Physicians. J. C. Trent.—p. 193.

5:217-264 (June) 1944

- Address of President-Elect: Extension of Medical Care in North Carolina. P. F. Whitaker.—p. 217.
Treatment of War Casualties. W. Walters.—p. 222.
Human Health and Common Weal. J. K. Hall.—p. 227.
Continuous Caudal Analgesia: Report on Its Use in 100 Obstetric Cases. A. T. Thorp.—p. 232.
*Fatal Poisoning with Thiocyanate in Treatment of Hypertension. K. D. Weeks.—p. 234.
Cardiospasm. W. H. Sprunt and J. A. Harill.—p. 238.
Resection of Presacral Nerves in Functional Uterine Dysmenorrhea. J. W. Farthing.—p. 241.

Poisoning with Thiocyanate in Hypertension.—Weeks reports 2 instances of severe potassium thiocyanate intoxication, one in a 41 year old married Negro woman who recovered and the other in a 45 year old white married man whose illness terminated in death. Both patients presented a clinical condition characteristic of severe thiocyanate intoxication in which psychosis, delirium, confusion and signs of central nervous system irritation predominated. The highest blood level obtained from the patient who recovered was 32 mg. per hundred cubic centimeters and in the fatal case it was 36 mg. per hundred cubic centimeters. The latter patient lapsed into coma on the third hospital day and died shortly thereafter. Thiocyanate intoxication was not suspected on admission in either case. An unusual feature of both cases, and one which has been previously reported in only 1 or 2 cases, was the occurrence of unexplained vascular phenomena. The patient who recovered had clinical, physical and x-ray evidence of pulmonary infarction. The explanation of its production was not apparent. In the other case there was found at necropsy a subdural hematoma in the left frontoparietal region which had ruptured into the subarachnoid space. There was no history of head injury before death, and no explanation was found at necropsy. Anginal pain, arterial thrombosis and painful enlargement of the thyroid may also be produced. The high cerebrospinal fluid thiocyanate level found in the 2 cases reported here suggests that signs and symptoms of severe poisoning are primarily due to the toxic effect on the central nervous system. This is substantiated by the absence of significant pathologic changes in other organs.

Northwest Medicine, Seattle

43:129-156 (May) 1944

- What the Future Holds for America. C. E. Martin.—p. 132.
Incidence of Common Duct Stones and Postoperative Management of the T-Tube. J. W. Baker and M. H. Evey.—p. 137.
Human Salmonella Suipertifer Infection: Report of Unusual Case. J. E. Hunter, C. A. Andresen, W. B. Hutchison.—p. 142.
Electrocardiogram After Exercise in Angina Pectoris. G. D. Capaccio.—p. 144.

43:157-184 (June) 1944

- Current Problems in Relation to Accelerated Program for Premedical and Medical Education. O. Larsell.—p. 161.
*Filariasis. W. O. Ramey.—p. 164.
Rheumatic Fever in Childhood. P. F. Guy.—p. 166.
Infectious Neuritis. A. L. Severeide.—p. 169.
Hemorrhagic Tumors of Ovary. E. B. Brookbank.—p. 170.
Treatment of Parasites of Small Intestine with Dover's Powder. J. O. George.—p. 172.

Filariasis.—Ramey says that filariasis is primarily the result of fibrotic changes, causing obstruction to the lymphatic and venous flow. Among the microscopic changes are hyperplasia of the connective tissue and infiltration of lymphocytes, basophilic cells and eosinophils. These changes may be manifested as (1) chronic adenitis with or without obstruction and elephantiasis or (2) dilatation of lymphatics with or without elephantiasis. Some other lesions are (1) the lymphatic varix, which is a tumor consisting of a mass of dilated lymph vessels, (2) lymph scrotum, the result of dilatation of the scrotal lymphatic system and pronounced lymphedema, elephantiasis frequently supervening and adding to the enlargement, and (3) elephantoid

fever, which is characterized by pyrexia attributable to inflammation of intra-abdominal or intrapelvic structures and is usually associated with pain. The onset of the disease is characterized by pyrexia of 102 to 104 F., headaches, rigor, anorexia, often nausea, occasionally vomiting and a depressed mental state. The affected part presents signs of an acute inflammatory process, which may be of the lymphatic type or the erysipeloid variety; usually the acute symptoms largely subside in a few days, but the pronounced swelling persists. More than 70 per cent of cases recently reported from a mobile hospital showed scrotal involvement and, in more than half of these, involvement of an extremity. Septicemia and death may supervene. The tendency of the fever to recur, the severe rigor, pyrexia and terminal diaphoresis have caused it to be mistaken for malaria. There is no specific drug therapy for filariasis. The treatment should consist of bed rest, morphine for pain, elevation of the affected part to assist in postural drainage, a semielastic bandage to prevent swelling, keeping the skin well cleansed with soap and water, sulfonamide drugs, which frequently are found to exercise a distinctly beneficial effect, and surgical operation for such conditions as lymph scrotum. The only known definite aid to filarial disease is removal to a cool climate; the patient should be told frankly the nature and prognosis of the disease. The author stresses that filariasis may be acquired after only a few weeks stay in an endemic area. The extensive distribution of American forces in areas where filariasis is endemic suggests that filarial infection may be introduced in all parts of the United States. It becomes necessary to include a consideration of filariasis in the differential diagnosis of acute fevers, edema, pseudodema, varicosities, glandular enlargements, lymphatic disease, general enlargements of the extremities, synovitis and arthritis in all persons returning from the tropics and subtropics.

Pennsylvania Medical Journal, Harrisburg

47:769-864 (May) 1944

- Medical Progress in War Effort. D. L. Borden.—p. 783.
Surgical Treatment of Cranial Trauma. F. C. Grant.—p. 790.
Etiology and Control of Progressive Axial Myopia. H. H. Turner.—p. 793.
Bromide Intoxication: Some Observations on Its Treatment with Sodium Chloride and Desoxycorticosterone. M. G. Wohl and H. F. Robertson.—p. 802.

47:865-960 (June) 1944

- Selection and Interpretation of Laboratory Tests. W. M. Yater.—p. 883.
Typhus Fever: Case Report. R. C. Hamilton and J. C. Fleming.—p. 892.
Trends and Shortcomings in Approach to Gastrointestinal Diseases: Review Based on Experience in an Army General Hospital. J. E. Berk.—p. 897.
Problems of Rural Surgeon. C. M. Hower.—p. 902.

Puerto Rico J. Pub. Health & Trop. Med., San Juan

19:551-698 (June) 1944

- Experimental Plague in Guinea Pigs Inoculated with Pasteurella Pestis of Ecuadorian Origin. A. Macchiavello and D. Urigen.—p. 577.
Use of Calcium Gluconate in Treatment of Malarial Chills. D. S. Stevenson.—p. 602.
Observations on Nocturnal Activity of Anopheles and Certain Other Mosquitoes in Eastern Puerto Rico. A. A. Weathersbee and G. E. Bohart.—p. 626.
Note on Mosquito Distribution Records of Puerto Rico and of Virgin Islands. A. A. Weathersbee.—p. 643.
Comparative Study of Results Obtained from Flocculation and Complement Fixation Tests Carried out Among 3,994 Selectees and Volunteers in 1941. O. Costa Mandry and J. L. Janer.—p. 649.
Note on Treatment of Schistosomiasis Mansoni with Gentian Violet. F. Hernández Morales.—p. 666.

Rocky Mountain Medical Journal, Denver

41:361-448 (June) 1944

- Coordination of Industrial Hygiene Instruction with Other Clinical Training. D. E. Cummings.—p. 379.
Tuberculosis and War Industry. W. P. Shepard.—p. 381.
Elements of Diagnosis and Prognosis in Pneumoconiosis. L. U. Gardner.—p. 385.
Review of Silicosis for Industrial Hygienist and Medical Practitioner. L. E. Hamlin.—p. 391.
Physician's Responsibility in Compensation Law Administration. B. E. Kuechle.—p. 399.
Benzene (Benzol) Poisoning: Report of Fatal Case with Autopsy Findings. R. H. Ackerly and G. E. Hawlick.—p. 402.
Management of Silicotic Patients. P. J. Ramberger.—p. 405.

Surgery, Gynecology and Obstetrics, Chicago

78:561-662 (June) 1944

- Surgical Construction of 80 Cases of Artificial Esophagus. S. S. Yudin.—p. 561.
- Cortical Kidney Tumor—Analysis of 100 Consecutive Cases. C. C. Herger and H. R. Sauer.—p. 584.
- Surgical Division of Spinothalamic Tract in Medulla. R. D. Adams and D. Munro.—p. 591.
- Use of Pectin and Other Agents to Prevent Shock. L. Figueroa and F. J. Laverie.—p. 600.
- Studies in Lymphatics of Female Urinary Bladder. T. O. Powell.—p. 605.
- *Rh Factor in Intragroup Blood Transfusion Reactions. B. C. Butler, D. N. Danforth and J. Scudder.—p. 610.
- Experimental Head Injury with Special Reference to Certain Chemical Factors in Acute Trauma. E. S. Gurdjian, J. E. Webster and W. E. Stone.—p. 618.
- Translocation of Peroneus Longus Tendon for Paralytic Calcaneus Deformity of Foot. W. H. Bickel and J. H. Moe.—p. 627.
- *Fractures of Neck of Femur: An Analysis of 157 Intracapsular and Extracapsular Fractures. I. E. Siris and J. D. Ryan.—p. 631.
- Induction Examination for Inguinal Hernia. L. Carp.—p. 640.
- Mesenteric Pouch Hernia Simulating Paraduodenal Hernia. R. B. McCarty and A. J. Present.—p. 643.
- Repair of an Avulsed Scrotum. E. P. Whelan.—p. 649.
- Three Pin Method for Treatment of Severely Comminuted Fractures of Os Calcis.—p. 653.

Rh Factor in Intragroup Blood Transfusion Reactions.—Butler and his associates observed an Rh negative obstetric patient who carried a dead fetus for two months and who then at the middle of the seventh month of pregnancy aborted a macerated stillbirth. Following the abortion, because of uncontrollable uterine hemorrhage, the patient went into shock. One hundred cubic centimeters of group O Rh positive blood was administered. A severe hemolytic transfusion reaction occurred which was characterized by chills and fever, hemoglobinuria, jaundice, oliguria and convulsions. The blood chemical findings are tabulated. Ten days after the transfusion reaction the woman had generalized convulsions, but she gradually recovered. The authors selected 25 similar cases of intragroup transfusion reaction from the literature and present them in tabulated chart form. They also outline a rational method of therapy. They emphasize that under no circumstances should obstetric patients be transfused with Rh positive blood unless the patients have been tested for the Rh factor.

Fractures of Neck of Femur.—Siris and Ryan analyze the management of 157 consecutive fractures of the neck and intertrochanteric region of the femur seen in the fracture service of the Third (New York University) Division of Bellevue Hospital from Jan. 1, 1941 to June 30, 1943. They stress that the treatment of choice for the intracapsular fractures in the aged and feeble is the immediate insertion of a Smith-Petersen cannulated three flanged nail or similar device. The treatment of choice for the intertrochanteric fractures in the aged is the immediate insertion of a device incorporating the principle of a Smith-Petersen nail and Hawley bar, preferably a Moore-Blount blade plate. For intertrochanteric fractures in the younger age group bilateral Russell traction suspension has given satisfactory results, and the authors see no reason at present to change their opinion. External pin fixation should not replace internal fixation for fractures of the hip or intertrochanteric region. Other than expediting the procedure of transfixion and minimizing the immediate trauma, it has none of the advantages of internal fixation. It is an extremely hazardous procedure and should be restricted to those who have had experience and are familiar with its technic. The authors think that the patients who are in a poor physical condition on admission have a better chance of survival if they are operated on immediately rather than waiting to see if their general condition improves. They disagree with the selection of survivors policy in which all patients are treated conservatively for a few days and then the operation is decided on only for those who it is expected will survive. Immediate operation permits early ambulation in bed without pain and reduced incidence of potential complications and allows early ambulation with crutches. The use of local anesthesia, focal skin clips and guide wires and the three sets of indispensable roentgenograms to determine (1) the accuracy of reduction and location of the skin clip in relation to the head of the femur, (2) the position of the guide wires and (3) the position of the nail will enhance the ability of the surgeon to expedite the proper insertion of the transfixion device.

Texas State Journal of Medicine, Fort Worth

40:1-42 (May) 1944

- Psychosomatic Medicine. J. R. Ewalt.—p. 5.
- Preparation of Plasma. J. H. Glynn.—p. 10.
- Sulfonamide Treatment of Gas Gangrene. R. L. Sewell.—p. 12.
- Gastrointestinal Tuberculosis: Medical Aspects. G. M. Underwood.—p. 14.
- Spinal Anesthesia. C. M. Simpson and E. O. Bradfield.—p. 18.
- Problems Pertaining to Socialization of Medicine. A. E. Greer.—p. 24.

Virginia Medical Monthly, Richmond

71:279-338 (June) 1944

- Preliminary Report of Study of 200 Autopsy Cases at Eastern State Hospital, with Special Emphasis on Neuropathology and Brain Tumor in Old Age. I. S. Zfass and W. Riese.—p. 281.
- *Femoral Vein Ligation in the Treatment of Pulmonary Embolism Due to Femoral Thrombophlebitis. E. L. Lowenberg.—p. 288.
- *Medical Treatment of Pulmonary Embolism. J. R. Beckwith.—p. 296.
- Questions on Vitamin B Complex and on Iodine, Sulfocyanate and Mendeleeff's Law. J. H. Smith.—p. 301.
- False Negative Results in Friedman Test for Pregnancy. R. Duxton.—p. 303.
- Primary Atypical Pneumonia. S. G. Page Jr. and C. R. Tittle.—p. 305.
- Spina Bifida and Polydactyly in One Egg Twins: Case Report and Medical Aspects. W. B. Quisenberry.—p. 309.
- Demonstration of Tuberculous Bacillæmia: Comparison of Guinea Pig Inoculation of Whole Blood and Sediment Concentrated by Loewenstein Method. J. S. Howe.—p. 312.
- George Ben Johnston and Listerism. F. S. Johns.—p. 314.

Femoral Vein Ligation in Pulmonary Embolism.

Lowenberg reports 3 cases of pulmonary embolism in which the femoral vein was ligated, with cessation of the embolic episodes. He also reports 2 cases in which ligation was not performed, with fatal consequences. Emphasizing the importance of early recognition of thrombophlebitis of the lower extremity and especially in the deep veins of the calf, he discusses the importance of Homans' test and the status of venography. He advocates femoral vein ligation as a routine emergency procedure whenever pulmonary embolism incident to lower extremity thrombophlebitis has occurred. In such instances the procedure may well be life saving. Whether femoral vein ligation is to be routinely performed in all cases of deep vein thrombosis remains to be proved, but in time the dictum may well be "the treatment of femoral vein thrombophlebitis is femoral ligation." Ligation of the femoral vein at as high a level as possible often has a salutary effect on the thrombophlebitic process even though the ligation is not performed entirely above the inflammatory process, owing to total interruption of the blood flow through the affected veins.

Medical Treatment of Pulmonary Embolism.—Beckwith shows that the classic picture of pulmonary embolism is not difficult to recognize. When a patient who has been lying in bed sits up or strains at stool and suddenly becomes dyspneic and develops severe substernal pain, pallor, sweating, weak rapid pulse and low blood pressure, the diagnosis is obvious. At times the symptomatology may be bizarre. Pneumonia, pleurisy or progressive heart failure may be suspected. The finding of a hitherto unsuspected thrombosis of a deep leg vein may be a lead. X-ray examination may also be helpful. Characteristic electrocardiographic changes often occur. Careful clinical examination of the patient is very necessary, and detection of signs indicating pulmonary hypertension and right ventricular failure is important. When an acute episode occurs and the diagnosis of pulmonary embolism is made, therapy should be immediately instituted. This should be directed at relieving the anoxemia by the administration of oxygen in high concentration and simultaneously making an effort to reestablish the impaired circulation. The latter can be done by the administration of atropine $\frac{3}{50}$ grain (0.0013 Gm.) and papaverine $\frac{3}{2}$ grain (0.032 Gm.) intravenously. Then atropine and papaverine should be given every four hours. The response is often dramatic, and a patient who looks moribund may be "responsive" in a short while. The heart rate becomes slower, blood pressure rises, the heart sounds become louder and the color improves. During the past two years the author has seen 3 cases of pulmonary embolism shortly after the condition occurred. All were treated as described and all obtained dramatic relief following the initial attack. Two died later with subsequent attacks and 1 recovered completely. It is probable that, had the focus of the embolus been found, the latter episodes could have been prevented. The cases are presented.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

19:1-42 (March) 1944

Erythroblastosis Foetalis. J. R. Gilmore.—p. 1.

*Scheme for Prevention of Cross Infection in Children's Wards. N. M. Jacoby.—p. 26.

Prevention of Cross Infection in Children's Wards.—

Jacoby describes a scheme which was to guard against the dangers of cross infection and was carried out for a year in a new children's ward. A plan of the ward is shown in a diagram. Infants up to 18 months of age who had no infection were admitted to single rooms where no case of known or suspected infection was ever allowed. Infants up to 18 months of age who, although suffering from an infection which excluded them from class 1, are themselves equally susceptible to cross infection, were likewise admitted to single rooms. Children over the age of 18 months suffering from noninfectious disease, e. g. rheumatic fever, chorea, nephritis, diabetes and epilepsy, were admitted to the larger wardlets (with 4 to 6 beds). Children of all ages suffering from infectious diseases, e. g. tonsillitis, respiratory infection, alimentary infection and otitis media, were admitted to the small wardlets, one type of disease being kept in each wardlets as far as possible. Children of all ages suffering from tuberculosis were admitted to the large ward originally designed as a solarium. Only fully trained nurses or senior probationers were selected for nursing, and as far as possible no nurse was given charge of "clean" and infected cases at the same time. All doctors, nurses, students, cleaners, visitors and any one else who wished to enter a ward was required to wear a gauze mask covering the nose and mouth. Infectious cases were nursed on full barrier precautions. Children who were not continuously in bed were not allowed to leave their rooms. The infants' feeds were prepared with full aseptic technic. No precautions, other than those in general use in the hospital, were taken over the food of the older children. Visitors were discouraged. The best results as regards prevention of cross infection were obtained in groups 1 and 2, who were given the best bed isolation. The highest incidence of cross infection was among the tuberculous children, and this is readily explained by the fact that they occupied the largest ward and stayed in the hospital for very long periods. The total incidence at 6 per cent appears to be of a low order compared with 18.9 per cent reported by Wright in 1940. In the conclusion the author stresses once more the importance of bed isolation, careful classification on admission, a competent nursing staff and face masking. He shows that, if children's wards are to be made safer, attention will have to be paid to their architecture, and the staffing with nurses must be on a generous scale. Moreover, the number of beds for children will have to be increased.

British Heart Journal, London

6:53-114 (April) 1944

Paroxysmal Heart Block and Ventricular Standstill. J. S. Lawrence and G. W. Forbes.—p. 53.

Heart Block with Aneurysm of Aortic Sinus. P. F. Duras.—p. 61.

Stokes-Adams Attacks in Child. V. S. Stern.—p. 66.

*Complete Heart Block. M. Campbell.—p. 69.

Rare Case of Complete Heart Block. K. Saracoglu.—p. 93.

Social and Economic Conditions and Incidence of Rheumatic Heart Disease. G. H. Daniel.—p. 103.

Unusual Electrocardiogram in Dextrocardia. J. M. Holford.—p. 105.

Auriculoventricular Rhythm. R. A. Miller.—p. 107.

Complete Heart Block.—Campbell discusses 64 cases of heart block, mostly complete, which were seen during the same period as 29 cases with dropped beats and 140 cases with latent heart block. Of the patients attending the cardiographic department of Guy's Hospital during twelve years 0.6 per cent had complete, 0.5 per cent partial and 2.2 per cent latent heart block. The author gives particular attention to the prognosis, incidence and significance of Stokes-Adams attacks and the extent to which complete block remains persistent or varies to lower grades of partial or latent block. Complete heart block is most

often seen in men in the seventh decade with enlarged hearts and atherosclerosis but no other evidence of gross heart disease. Four fifths of the patients were men and 84 per cent were over 50 years of age. Syphilitic and rheumatic heart disease were responsible for only just over 10 per cent of the cases. Myocardial disease was responsible in three fourths of the cases. Cardiac enlargement with no other signs of atherosclerosis was the evidence of myocardial disease in nearly half of the cases, high blood pressure, angina pectoris or congestive failure being present in the other half. The heart rate averaged just under 35 (excluding congenital cases, in which it was generally 40 to 56). Heart block may be complete, partial, partial with dropped beats or latent. Complete heart block may be established or varying, changing to other degrees of block, or interrupted. It may also be transient, due to a known infection or to a specific episode such as cardiac infarction, or paroxysmal, of which there are two varieties, paroxysmal complete heart block when the usual rhythm is latent heart block and paroxysmal heart block (complete) when the usual rhythm shows a normal PR interval. Although complete heart block is a serious lesion, some, especially those under 40, live for many years in reasonably good health. Of the author's patients 50 were followed for more than two years or until death. Thirty-four were dead after an average period of 2.5 years; others were observed for from two to six years and still others for from seven to twenty years. Stokes-Adams attacks were present in half the patients with complete heart block. When they were present they were one of the earliest if not the first significant symptom of heart block. In those without Stokes-Adams attacks, dyspnea or attacks of faintness or dizziness were the main presenting symptoms. The prognosis was considerably worse in those with Stokes-Adams attacks. Of 30 with Stokes-Adams attacks 24 died during the period of observation, whereas of 20 without Stokes-Adams attacks only 10 died. Sixty-one per cent of those with Stokes-Adams attacks died suddenly and of the others only 1 died suddenly. If when a patient is first seen with complete heart block he has not had a Stokes-Adams attack, the risk of such an attack developing or of his dying suddenly is not great, and with each month that has passed the risk becomes still less.

British Journal of Urology, London

16:1-34 (March) 1944

*Treatment of Arterial Hypertension with Potassium Thiocyanate. J. L. D'Silva and G. Evans.—p. 1.

Potassium Thiocyanate in Arterial Hypertension.—

D'Silva and Evans studied the effects of potassium thiocyanate in the treatment of 25 patients with hypertension. During the first week the patients were given three times daily 0.1 Gm. of potassium thiocyanate. At the end of the week, that is, after 2.1 Gm. had been given, the serum thiocyanate content was determined. In some patients the serum concentration was less than 4 mg. per hundred cubic centimeters, in others it was between 4 and 11 and in still others it was over 11, in 1 patient as high as 15. This showed that the requirements of the patients varied greatly and that caution was necessary. The dosage was altered in steps of 0.4 Gm. weekly until a serum level of from 5 to 12 (usually from 7 to 9) mg. per hundred cubic centimeters was obtained. Once the individual patient's requirement of potassium thiocyanate was established in the hospital, the follow-up after discharge from the hospital, with blood thiocyanate estimations at less frequent intervals, was fairly satisfactory. Summarizing their observations, the authors say that 11 of the 25 patients responded by a considerable fall and 6 by a slight fall in blood pressure. In 8 cases the blood pressure was unchanged. Headache, vertigo and lack of concentration were the associated symptoms most often relieved. The drug was administered safely to elderly patients and those with electrocardiographic evidence of myocardial degeneration. Two patients with cerebral arteriosclerosis benefited greatly by treatment. No patient with severe renal dysfunction was encountered in this series. Two patients were poisoned with the drug but made uneventful recoveries when its administration was suspended.

Irish Journal of Medical Science, Dublin

6:169-200 (June) 1944

- *Heart in Pregnancy, with Special Reference to Public Health. G. E. Donovan.—p. 169.
Middle Meningeal Hemorrhage and Concussion. A. A. McConnell.—p. 179.
Estimation of Prolimin in Blood and Urine and Study of Its Excretion. A. E. A. Werner.—p. 189.
Observations on Treatment of Psychosis by Electrically Induced Convulsions. J. Delany and J. R. Shea.—p. 193.
Carcinoma of Fallopian Tube. R. M. Corbet.—p. 196.

Heart in Pregnancy.—Donovan points out that the effects of pregnancy on the normal woman may produce both symptoms and signs which closely simulate heart disease, e. g. shortness of breath, palpitation, fulness of the neck veins, rales at the lung bases and a change in the radiographic silhouette of the heart similar to that of mitral stenosis. Citing figures mostly of American investigators, Donovan shows that heart disease is not a common complication of pregnancy. He cites a New York report which indicates that in mothers with known heart disease the death rate was 10.3 per thousand pregnancies, compared with 2.0 per thousand for all obstetric patients. Post-mortem studies by Glasgow authors revealed that of 813 patients who succumbed during pregnancy or puerperium 108 had acute or chronic heart lesions. Mitral stenosis is the predominant lesion in heart disease complicated by pregnancy. Auricular fibrillation causes approximately four times more deaths than any of the others. Antepartum supervision, with early hospitalization in those cases needing it, materially reduces the mortality rate. There are two schools of thought regarding the best methods of delivery. One favors cesarean section; the other prefers delivery by the natural route with general anesthesia and the application of forceps at a certain stage. Those who prefer cesarean section argue that it is possible to choose a time for the operation with a strict regard for the heart condition of the patient; physical strain of labor is avoided, and *there is reasonable certainty of producing a living child.* Those who favor natural delivery maintain that women with heart disease usually have easy labors, owing possibly to the laxity of the tissues. The sudden flooding of the circulation at the time of the contraction of the uterus may be a causal factor in the increased incidence of heart failure in the first twenty-four hours of the puerperium. Venous section and the application of a tight abdominal binder as soon as the uterus is evacuated may help. The danger involved in anesthetizing and operating on pregnant women suffering from heart disease has been exaggerated. Probably nitrous oxide and oxygen supplemented by ether is as good as any anesthetic. The use of spinal anesthesia is of doubtful wisdom. It is inadvisable for patients who suffer or have suffered from heart failure to become pregnant. Antepartum clinics should have facilities for special investigations; x-rays and electrocardiographs should be available. Some antepartum cases require hospital treatment, investigation or supervision.

Lancet, London

1:649-680 (May 20) 1944

- Reflections on Reform in Medical Education. T. Lewis.—p. 649.
War Surgery of Extremities in Light of Recent Experience. J. Trueta.—p. 651.
Case Finding by Mass Radiography: Report on 500 Selected Cases. A. Kahan and H. G. Close.—p. 653.
*Pneumococcal Meningitis Treated with Penicillin. H. Cairns, E. S. Duthie, W. S. Lewin and H. V. Smith.—p. 655.
Fractured Femoral Shaft: New Approach to Problem. G. R. Fisk.—p. 659.

1:681-712 (May 27) 1944

- Gunshot Wounds of Knee Joint. S. J. D. Buxton.—p. 681.
Reflections on Reform in Medical Education. T. Lewis.—p. 685.
Effect of Vitamin C Deficiency on Experimental Wounds: Tensile Strength and Histology. G. H. Bourne.—p. 688.
Pruritus Ani: Practical Approach. A. J. Cantor.—p. 692.
Tissue Culture of Malaria Parasites (*Plasmodium Gallinaceum*). F. Hawking.—p. 693.

Pneumococcal Meningitis Treated with Penicillin.—Cairns and his co-workers report 8 cases of pneumococcal meningitis treated with intrathecal penicillin, supplemented in 3 cases with penicillin intramuscularly. In 6 cases recovery was complete;—in 2 cases leptomeningitis was controlled but death subsequently occurred, one from subdural abscess, the other from brain abscess, ventriculitis and obstruction of the

aqueduct of Sylvius. Both sodium and calcium salts have been used intrathecally. Concentrated solutions of approximately 5,000 units per cubic centimeter were made in distilled water, which after Seitz filtration and assay were diluted in water or isotonic solution of sodium chloride to 250 to 500 units per cubic centimeter. Repeated daily injections of these solutions into the lateral ventricles or lumbar subarachnoid space in amounts of 4 to 10 cc. have not produced impairment of nervous function. The usual dosage was 3,000 to 4,000 units per injection. This was given daily for from four to nine days in the uncomplicated cases. The dose was varied: the smallest, 659 units, caused only temporary disappearance of pneumococci; the largest, 20,000 units, was too high for this preparation and produced a severe reaction. The total amount injected intrathecally has varied between 10,000 and 85,000 units. In the mild cases the intrathecal injections of penicillin can all be given by the lumbar route, but the ventricular route should be employed if there is not prompt clinical improvement or if blockage of the cerebrospinal pathways is suspected. In severe cases it would seem desirable to combine lumbar and ventricular injection. When adequate supplies of penicillin become available it may be wise to give penicillin intramuscularly or intravenously for a few days. The authors treated 8 further cases, in 2 of which death occurred. This makes a total of 16 fully treated cases, with 12 recoveries. The majority of the recent cases provided additional evidence of the beneficial effect of sulfonamides. Although much less effective than penicillin sulfonamides can be administered by mouth, and they pass readily from the blood stream into the cerebrospinal fluid.

Medical Journal of Australia, Sydney

1:429-452 (May 13) 1944

- Strongyloidiasis in Man: Infestation with *Strongyloides Stercoralis* (Bavay, 1876). T. E. Lowe and H. O. Lancaster.—p. 429.
Therapeutic Value of Sulfaguandine in Treatment of Bacillary Dysentery at an Australian General Hospital. B. A. Baker.—p. 435.
Use of Chorioallantois of Developing Chick Embryo in Diagnosis of Smallpox. E. A. North, J. A. Broben and A. H. Mengoni.—p. 437.
Lepromin Test in Laboratory Animals. J. W. Fielding.—p. 439.

Practitioner, London

152:345-408 (June) 1944

- Water Metabolism in Relation to Hot Weather. J. M. O'Connor.—p. 345.
Summer Sports. A. Abrahams.—p. 352.
Public Health Aspects of Diseases Prevalent in Warmer Weather. E. H. R. Smithard.—p. 355.
Skin Disorders of Warmer Weather. J. Sommerville.—p. 362.
Diet in Hot Weather. Rose M. Simmonds.—p. 370.
Significance of Minor Head Injuries. G. C. Knight.—p. 377.
Some Problems of Breast Feeding. F. Charlotte Naish.—p. 384.
Interpretation of Physical Signs: VI. In Gynecology. V. B. Green-Armytage.—p. 392.

Schweizerische medizinische Wochenschrift, Basel

73:937-960 (July 31) 1943. Partial Index

- Organization of Climatic Treatment of Patients Not Suffering from Tuberculosis. K. von Neergaard.—p. 937.
Problems and Requirements of Balneologic and Climatologic Investigations in Switzerland. W. Mörkofer.—p. 939.
Development of Spas in Switzerland; Demands and Requests by Balneologists. J. Weber.—p. 941.
New Methods and Possibilities of Analyses of Springs. W. D. Treadwell.—p. 944.
Spontaneous Sciatic Causalgia. C. Julliard.—p. 946.
*Endocrine Obesity and Spastic Abdominal Syndrome. H. J. Schmidt.—p. 948.
Percutaneous Electrosurgical Puncturing of Lateral Ligament of Knee Joint. F. Becker.—p. 950.
Severe Stenotic Laryngotracheobronchitis Complicated by Pericarditis and Its Effective Treatment by Tracheotomy, Naphazoline Preparation and Sulfathiazole. H. Martin and J. Murry.—p. 951.

Endocrine Obesity and Spastic Abdominal Syndrome.

—The subjects of Schmidt's report were 3 women, 29, 44 and 46 years of age with endocrine adiposis associated with a predominant spastic abdominal syndrome. Froehlich's type of hypophysial-genital adiposis was present in 1 case and hypophysial-adrenal obesity associated with pronounced virilism in the 2 others. The spastic abdominal syndrome corresponded to the picture of spastic neuropathic colitis. Renal and ureteral colics in addition to intestinal colics were predominant. They are considered to be manifestations of the same functional dis-

order in two closely related organic systems rather than disorders which are different in principle. Anatomic changes could not be demonstrated in the intestinal canal, but mild bilateral hydronephrosis was shown by 2 of the cases. This hydronephrosis may have been a sequel of the ureteral colics rather than their origin, since a mechanical cause was missing and hydronephrotic changes could not be demonstrated on roentgenologic and postmortem examination. Primary functional disturbances of intestine and ureter in the sense of neuromuscular dyskinesia on a vegetative-nervous base are suggested. Psychic anomaly was present in all 3 cases. A basic depressive attitude was manifested and was associated with a pronounced hysteriform tendency. The accompanying polynurotic syndrome was characterized by subjective complaints without any objective neurologic findings. The porphyria examination always was negative. The conformity of the symptom complex of these 3 cases suggests an internal genetic relationship, but no indication was presented with regard to its type.

Medicina Española, Valencia

7:277-398 (March) 1944. Partial Index

- *Early Rising and Pulmonary Embolism After Abdominal Operations. E. Marescot.—p. 284.
Renal Diabetes in Infant: Case. D. Duran.—p. 335.
Vitamin B₁ in Therapy of Whooping Cough. L. Cortés de los Reyes.—p. 347.

Early Rising and Pulmonary Embolism.—Marescot emphasizes the importance of early rising after abdominal operations in prevention of pulmonary embolism. The author performed 1,192 abdominal operations during a period of five years in the Pontevedra Hospital. Early rising was practiced in the majority of the cases. Of the small group of patients who remained in bed for more than one week after the operation thrombophlebitis occurred in 4. The patients were ordered to rise immediately from bed, to move their legs and to walk. Phlebitis was controlled. Pulmonary embolism occurred in 1 case. It was benign and controllable.

Revista de la Asoc. Méd. Argentina, Buenos Aires

58:163-216 (April 15) 1944. Partial Index

- Vitamin K in Therapy of Hypertension. A. Barcellos Ferreyra.—p. 163.
*Dissecting Aneurysm of Aorta with Diagnosis During Life of Patient. J. E. Israel and J. Valotta.—p. 174.
*Adrenal Cortex Extract in Vomiting of Pregnancy. E. Bottioli.—p. 181.

Dissecting Aneurysm of Aorta.—According to Israel and Valotta, diagnosis of dissecting aneurysm of the aorta during the patient's life is difficult. Changes in the tunica media of the artery constitute the main pathogenic factor. Fissure of the intima layer of the artery and arterial hypertension are inconstant secondary factors. Sudden acute precordial pain which radiates to the back and to the lumbosacral region along the course of the aorta, combined with the feeling of impending death, followed by shock, paralysis and signs of arterial obstruction are the predominant symptoms. X-ray examination shows great enlargement of the thoracic segment of the aortic shadow, double border of the aortic shadow in the frontal view and left ventricular hypertrophy. Recovery after the acute attack is extremely rare, although possible. The authors report that a man aged 43 with hypertension of long standing suffered an acute attack of severe precordial pain followed by paralysis of both legs. The roentgenogram was typical of a dissecting aneurysm of the aorta. Treatment consisted of intravenous injections of papaverine and bed rest. Paralysis greatly improved, the patient being able to walk one month after the attack. He led a comfortable existence for eight months, when he suddenly died. A necropsy was not permitted.

Adrenal Cortex Extract in Vomiting of Pregnancy.—Bottioli administered adrenal cortex extract to a large number of patients during the last three years for vomiting of pregnancy. The patients belonged to four groups: (1) those with nausea but no vomiting, acidosis or asthenia, (2) patients with acute nausea, vomiting and asthenia but without acidosis, (3) patients with acute nausea, vomiting, asthenia and acidosis and (4) patients with intractable vomiting. Intravenous injections of dextrose solution, a diet of thirst and hunger, enemas of urine of pregnant women, large doses of sodium bicarbonate,

insulin, belladonna and thyroid preparations failed in all of the cases. Intramuscular injections of desoxycorticosterone and adrenal cortex extract controlled the nausea and vomiting within three days or a week. It is advisable to administer tablets of 0.10 Gm. of powder of the cortex for one week after vomiting has been controlled. Adrenal cortex extract is a harmless substance which has no contraindications.

Deutsche medizinische Wochenschrift, Leipzig

69:349-378 (April 30) 1943. Partial Index

- *Constrictive Pericarditis and Its Therapy. F. Koch.—p. 349.
Localization of Urticarial Rash Following Injection of Foreign Serum. A. Cimbal.—p. 353.
Febris Neuralgica Periodica (Wolhynic Fever, Five Days Fever). E. von Bormann.—p. 356.
Allergy in Trichinosis. F. Linneweh and Harmsen.—p. 359.
Thrombopenia and Blood Coagulation. H. Werner.—p. 363.
Gastroenterogenous Pellagra. W. Seitz.—p. 365.
Generalized Thrombopenia After Single Arsphenamine Injection (comment on an article on same subject by Heinsen and Wachter). K. Zieler.—p. 368.
Generalized Thrombopenia After Single Arsphenamine Injection. H. A. Heinsen.—p. 369.

Constrictive Pericarditis and Its Therapy.—The concept of cardiac insufficiency resulting from embarrassment of the diastolic phase of the heart action will be of considerable help in the diagnosis of constrictive pericarditis and as an indication for surgical intervention. Differentiation between tuberculous and rheumatic nature of the condition is of no importance, so far as intervention is concerned, except where definite tuberculous changes in other organs are present, when the operation should not be performed. The earlier the intervention is performed, the more promising the result. Operation gives best results where a complete cure from acute pericarditis has occurred. In such cases even the removal of the feltlike fibrous tissue over the auricles and between the large vessels may be possible and the formation of adhesions with proliferation of connective tissue and cicatrization may be prevented. Operation is recommended nevertheless for the very grave cases, since they are not amenable to any other type of treatment. It is important to commence the surgical intervention on the left ventricle in order that an increased cardiac output may be coped with. Definite improvement may result from this conduct of the operation when first the left ventricle and the right ventricle and even portions of the auricles are freed. Unsatisfactory results, in spite of the fact that the heart had been freed to a large extent, may be due to the anatomic conditions of the posterior wall of the pericardium and its junction with numerous vessels. Adhesions may be particularly pronounced at this area. Two conditions throw light on this state before the intervention. Pulmonary stasis at the base of the lungs, as demonstrated on roentgenologic examination and not amenable to conservative treatment of the heart, is to be regarded as a sequel to the massive obstruction to the filling power of the left auricle. The electrocardiographic recordings of 7 of 20 patients with definite constrictive pericarditis revealed auricular fibrillation, and a peculiar change of the P deflection was shown by the electrocardiograms of the other 13 patients. It was interpreted as a transitional change from the normal stimulation period to fibrillation and as an impairment of the auricular contraction. That corresponds with the anatomic condition of some of these cases, in which calcification was demonstrated on roentgenologic examination. The electrocardiogram of 13 of the 20 cases also showed a definite change in the ST segment, which was depressed more or less below the zero line, particularly in leads 2 and 3. There was an upward convexity of the ST segment ending with a negative T. The peculiar change of the P deflection associated with the well defined changes of the ST segment strongly suggests the occurrence of constrictive pericarditis. In these cases the success of surgical intervention is doubtful and a two stage operation is suggested in those in which the parietal layer and the visceral pericardium can be separated. Conservative management with digitalis, rest, diet and systematic training of the functional capacity of the heart is advisable during the period of improvement following the first stage operation. The second operation is easier and will make more promising the freeing of the right ventricle and of the auricles.

Book Notices

Heart Disease: An Elementary Reference for Physicians. By Robert S. Berghoff, M.D., F.A.C.P., Clinical Professor of Medicine, Loyola University School of Medicine, Chicago. Issued Under the Auspices of the Post-Graduate Committee of the Illinois State Medical Society. State of Illinois, Department of Public Health, Circular No. 176. Paper. Pp. 63. Springfield, 1944.

This booklet has been prepared as an elementary syllabus on heart disease for physicians. There are nine chapters of from three to fourteen pages, on congenital heart disease, rheumatic endocarditis, syphilitic heart disease, arteriosclerotic heart disease, acute and subacute bacterial endocarditis, hypertensive and thyroid heart disease, diseases of the pericardium, abnormalities of rate and rhythm and left ventricular failure vs. right ventricular failure. The plan is excellent but the execution is disappointing. The book fails to present the newest advances in our knowledge of various conditions, such as congenital heart disease in the case of the auricular septal defect. In the discussion of rheumatic heart disease there is little or no statement of the myocardial involvement which is predominant in the early cases and which is responsible for the early dilatation and murmurs. Valvular deformity is a later manifestation. Syphilitic heart disease is essentially syphilitic aortitis and in many cases does not show heart involvement at all. "Heart involvement" should really be "aortic involvement." It is impossible to diagnose syphilitic aortitis early in its course. The symptoms and signs described are late, and it should be emphasized that percussion is notoriously inaccurate in the measurement of the aorta.

Under the heading arteriosclerotic heart disease many cardiologists would doubt any common existence of the senile heart per se, in persons in the fifties, for example. Also individuals vary much in their aging. It is important to recognize that coronary disease is not necessarily a disease of senility; it increases with age, of course, but it is an important disease of youth. Angina pectoris is not necessarily severe. Its position, character and causation are much more important than its severity. Minor myocardial infarction does not require eight weeks for adequate cicatrization, at least for consideration in treatment clinically. Four to six weeks suffice for adequate scar formation. Also it is important to note that the status anginosus, as in the case of acute myocardial infarction and angina pectoris decubitus, is not a chronic state. It should be regarded as an acute or subacute type of heart disease.

In the discussion of subacute bacterial endocarditis, some mention should be made of the reduction of mortality that has already occurred by the use of the sulfonamides and penicillin. In the discussion of hypertensive and thyroid heart disease pulsus alternans is inserted after gallop rhythm as a synonym, but these two conditions are not synonymous. Also most doctors would consider tobacco contraindicated in hypertension, since it is known that most persons show an elevation of blood pressure, especially if they are already hypertensive, during and immediately after smoking. In the chapter on diseases of the pericardium, the important condition of chronic constrictive pericarditis has been omitted. In chapter 8 digitalis intoxication as an important cause of paroxysmal ventricular tachycardia should be included. In the final chapter on congestive failure, one cannot separate, so clearly as is done here, either the symptoms or the treatment of left and right ventricular failure. Cyanosis due to pulmonary congestion is the result of left ventricular failure, not of right, but there may be added cyanosis in right ventricular failure due to stasis in the peripheral circulation. Pain of aortic origin or otherwise is not a characteristic symptom of left ventricular failure, and clubbed fingers are not characteristic of right ventricular failure. Finally, diuretics are important in the treatment of left ventricular failure as well as of right as is also a decreased fluid intake, and it should be noted that digitalis often helps left ventricular failure strikingly.

The usefulness of this pamphlet would be greatly increased with revision to bring it up to date. There are quite a few simple typographic errors that need correction.

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1943, With the Comments That Have Appeared in the Journal. Reprinted from The Journal of the American Medical Association. Cloth. Price, \$1. Pp. 130. Chicago: American Medical Association, 1944.

In the introduction to its "Official Rules," which have been used as a model by subsequent similar organizations, the Council on Pharmacy and Chemistry states that these were adopted "primarily with the object of protecting the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connection with proprietary medicinal articles." Later it is stated that the function of the Council is also "to advise the medical profession concerning the status of medicinal articles, . . . to publish reports on claimed advances in the use of drugs and to elaborate standards for the control and identity of drugs that are introduced into materia medica." In its earlier years the Council was chiefly occupied with examining individual preparations for compliance with the Rules, and the early reprints of the Council's reports are predominantly statements concerning the nonacceptability of many preparations. Latterly the emphasis has significantly changed to the more educational phase of the Council's work. The present volume of reprints is an excellent example of this trend. It contains only eight reports on rejected articles; and it is noteworthy that objections to these are on a much higher plane than those it was necessary to urge against the flagrantly quackish preparations of earlier days.

Perhaps the most noteworthy of the nineteen educational reports in this volume is the one declaring the Council's intention of using henceforth only the metric or centimeter-gram-second system in its publications. The report itself gives some interesting and readable history on the subject of weights and measures. Of most timely interest to the general physician as well as to the endocrine specialist is the report on nomenclature of endocrine preparations. The report gives a currently quite complete list of the available commercial preparations, including those not accepted by the Council as well as those which stand accepted. Another report in the field of endocrinology is that recognizing the use of estrogens in the treatment of prostatic carcinoma.

Attention should be called to at least two of the reports concerned with vitamin preparations, namely the status report giving the Council's decision that the evidence does not yet warrant the acceptance of cod liver oil preparations for external use and the report announcing the Council's recognition of the use of massive doses of vitamin D in the treatment of refractory rickets. The Council has previously objected to the use of massive doses of vitamin D in arthritis and in this volume includes a current comment from *THE JOURNAL* titled "Hope (false) for the Victims of Arthritis," which reemphasizes this objection.

The status report on xanthine compounds gives a much needed delimitation of the therapeutic claims that may be recognized for aminophylline and its related xanthine derivatives. Of similar interest is the report on the local use of sulfonamides in dermatology, and in the same category may be mentioned the report on agents for the treatment of trichomonas vaginitis, which points out that the present aim should not be for new medicaments in this field but for further information, especially concerning failures with those that have been used. In another status report the Council sets forth its conclusion that present evidence does not justify claims for advantage of oral use of sodium sulfonamides over the free drug.

In line with its decision to consider for acceptance various contraceptive preparations, the Council published a status report on conception control, which is included in this volume. The report comprises a series of concise statements on the various preparations and methods of control, prepared by Dr. Robert Latou Dickinson, together with a statement of criteria by which the Council will consider the acceptability of contraceptive jellies, creams and syringe applicators and nozzles, diaphragms and caps.

It cannot be too often said that this volume, as well as the other publications of the Council, remains of paramount interest to all who are concerned with rational use of therapeutic agents.

Taken all together, the printed record of the Council's work represents a fitting monument to a service born of unselfish altruism and continued in a spirit of finest devotion to the best interests of the medical profession and the public.

The Diet Therapy of Disease: A Handbook of Practical Nutrition. By Louis Pelnor, M.D., Assistant Attending Physician, Long Island College Hospital, Greenpoint Hospital, and Brooklyn Cancer Institute. Cloth. Price, \$3.75. Pp. 143, with 6 illustrations. New York: Personal Diet Service, 1944.

This book is intended for the guidance of the physician in providing the greatest possible benefits to the patient from use of properly selected diets. In many cases there is no therapeutic effect to be derived from the most careful selection of food types, but in such cases proper selection at least can be of value in lightening the burdens of the body.

In the brief introductory discussion covering the basic facts of nutrition, new developments of practical significance in this field are touched on. A question might be raised concerning the classification of vitamins given here as Council accepted and not accepted. A clearer understanding of their status would probably result from their differentiation as those whose significance in human nutrition is now established and those whose relationship to human nutrition is not yet determined.

The body of the book consists of diet lists for some thirty disease conditions in their various forms as well as many types of special diets. For each a sample diet covering the meals of one day is accompanied by a helpful discussion of the fundamental pathology of the disease and the principles governing a diet for that condition. In some cases it is felt that the author attempts to cover too much ground for a book of this nature by going into the differential diagnosis of the disease state. The dietary principles set forth are based on sound, up to date scientific information with numerous references quoted. The actual diet lists are quite simple and apparently have proved themselves practical from long experience. As brought together in one book such as this, a ready reference and sample diet source is available to the medical practitioner for the application of the developments in the science of nutrition.

Fundamentals of Psychiatry. By Edward A. Strecker, M.D., Sc.D., F.A.C.P., Professor of Psychiatry and Chairman of the Department, Undergraduate School of Medicine, University of Pennsylvania, Philadelphia. Second edition. Cloth. Price, \$3. Pp. 219, with 15 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

This book was first published in October 1942. Additional material was added in March 1943, and the present edition includes a single six page chapter on war neuroses that was not in the reprinting of the first edition. Otherwise the book appears to be unchanged except for minor typographic errors. The addition of this brief chapter would hardly seem to justify, in the opinion of the reviewer, a second edition. The book itself is excellent, as was pointed out in a review when it was first issued. Written by one of the leading psychiatrists in America, it is a brief, sound, compressed work, highly readable and excellent for the general medical adviser, who so often is faced with the problems of mental disease. This small manual can again be highly recommended as a useful and accurate summary of present day psychiatry.

Cancer: A Study for Laymen. Prepared for the Women's Field Army of the American Society for the Control of Cancer, Inc. [Compiled by] Clarence C. Little, Sc.D., Managing Director. Paper. Gratts. Pp. 122, with 54 illustrations. New York & Toronto: Farrar & Rinehart, Inc., 1944.

This can be regarded as an excellent manual if one keeps in mind that it is designed for the use of interested lay persons who have time to devote to study and to work in the cause of cancer control. It should not, however, be used outside the circles of interested workers. Its greatest usefulness will be among those who have at least a rudimentary knowledge of biologic science. It is prepared for the Women's Field Army of the American Society for the Control of Cancer, Inc., and is distributed free by that society, which may be addressed at 350 Madison Avenue, New York 17.

Our American Babies: The Art of Baby Care. By Dorothy V. Whipple, M.D. Introduction by C. Anderson Aldrich, M.D. Cloth. Price, \$2.50. Pp. 367, with illustrations. New York: M. Barrows and Company, Inc., 1944.

This book is well organized and the material is completely integrated, from antepartum management through the first two years of life. The information given is what every young mother desires and is especially adapted for those who are working. There is a certain authority which comes only from one who has both practical as well as the scientific knowledge of the many problems one encounters in the care of infants. The information on most subjects is very adequate. The chapter on the development of habits and their treatment is delightfully covered and would save much valuable time of the pediatrician if all mothers could read it. The book would make a valuable reference for all persons interested in the care of infants.

One Hundred Years of American Psychiatry. J. K. Hall, M.D., General Editor, Gregory Zilboorg, M.D., Associate Editor, and Henry Alden Bunker, M.D., Assistant Editor. Cloth. Price, \$6. Pp. 649, with illustrations. New York: Published for the American Psychiatric Association by Columbia University Press; London: Oxford University Press, 1944.

Psychiatry, like other branches of medicine, has made enormous progress in the last century. In this field American psychiatrists have played an increasingly important part. This volume is not intended to list past achievements or to present a symposium on what American psychiatry is doing today but rather, as pointed out in the foreword, is intended as a historical synthesis of a century of American psychiatric evolution. It is a little surprising to find such extremely wide margins and other wasted space in a book published in these days of paper shortage. The editorial board and the contributors have been well chosen and deserve congratulations on the interesting chapters presented.

Summary of State Legislation Requiring Premarital and Prenatal Examinations for Venereal Diseases. By Aneta E. Bowden, M.A., Ph.D., and George Gould, M.A., LL.B., Assistant Director, Division of Legal and Protective Services, American Social Hygiene Association, New York. Published and distributed by the American Social Hygiene Association in cooperation with United States Public Health Service. Second edition revised by George Gould. Paper. Price, 25 cents. Pp. 30, with 2 illustrations. New York, 1944.

As of Jan. 1, 1944 thirty states had passed legislation to prevent the spread of venereal disease through marriage by requiring a premarital examination as a condition to the issuance of a marriage license. A similar number of states had enacted antepartum examination laws to prevent syphilis in the unborn child. This summary represents an adequate, dependable analysis of such laws which will serve as a practical guide to health authorities, officials issuing marriage licenses, physicians and all others concerned. It will be particularly valuable to those who may be interested in the promotion of similar legislation in states in which laws of this character do not yet exist.

The Management of Neurosyphilis. By Bernhard Dattner, M.D., Jur.D., Associate Clinical Professor of Neurology, New York University Medical College. With the collaboration of Evan W. Thomas, M.D., Assistant Professor of Medicine and Assistant Professor of Dermatology and Syphilology, New York University Medical College, and Gertrude Wexler, M.D., Instructor in Dermatology and Syphilology, New York University Medical College. Foreword by Joseph Earle Moore, M.D., Associate Professor of Medicine and Adjunct Professor of Public Health Administration, Johns Hopkins University, Baltimore. Cloth. Price, \$5.50. Pp. 398, with 7 illustrations. New York: Grune & Stratton, 1944.

This book is a practical and much needed contribution. The author published another book on modern treatment of neurosyphilis eleven years ago when he practiced in Vienna. This publication is written along the same lines. It is divided into two parts, namely technics of withdrawal and examination of spinal fluid and methods of treatment, and application and results. The part on the spinal fluid is extremely well written, concise and encyclopedic in nature. It is the best the reviewer has ever seen on the subject. The second part is a textbook in itself. Every known form of treatment is described with technic and results. This book must be purchased by any medical man who treats any form of syphilis. It is the best at the present time. There is an index of authors and subjects.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

EVACUATION OF STOMACH OF INFANTS

To the Editor:—Can you suggest a dependable, safe and quick acting emetic to be used for young infants; one that may be given by mouth or by needle or both? It often happens that children get poisoned on fuel oil and the like, and emptying the stomach with a stomach tube is not altogether satisfactory because of food blocking the outlet of the tube. Syrup of ipecac, I have found, is too slow and cannot be relied on for prompt results.

C. C. Horton, M.D., Pendleton, S. C.

ANSWER.—Emetics are not as commonly used as in former times, though the list of these remedies has remained for the most part unchanged through the years. The emetics which are in common use may be briefly enumerated: Ipecac is used in the form of powder, 1 teaspoon to a glass of water or 1 tablespoon of the syrup in water repeated every fifteen minutes until vomiting is produced. Ipecac is uncertain and in large doses acts as a depressant. Zinc sulfate and copper sulfate are no longer in common use. One-half teaspoon of the zinc salt in water will usually cause emesis. Copper sulfate in 5 grain (0.32 Gm.) doses in warm water repeated in fifteen minutes will cause vomiting with only slight constitutional symptoms, but if not promptly ejected it may cause corrosion of the mucous surfaces. Mustard is safe but not certain in the desired action. One teaspoon in a cup of warm water should be given, repeated every fifteen minutes until vomiting is produced. Salt water, 2 tablespoons to a glass of water, sometimes produces the desired result. Apomorphine is a rapidly acting emetic, though most physicians are reluctant to use it for young infants on account of its toxic and depressant action. For young infants the dose is $\frac{1}{60}$ grain (0.0011 Gm.) hypodermically or $\frac{1}{2}$ to $\frac{1}{40}$ grain (0.0054 to 0.0032 Gm.) by mouth.

The emetics may be employed if lavage is contraindicated or inadvisable, though as a rule they are less reliable and are likely to be more depressing. Lavage is the method of choice in removing poisonous substances from the stomach. A catheter will serve the purpose, the diameter of which should vary with the size of the child. A small funnel may be attached to the lumen of the tube, and the stomach washing may proceed in the usual manner. In most cases it is preferable to attach a 20 cc. glass syringe (larger size if available) to the catheter. Water should be slowly and gently forced through the catheter into the stomach, followed by immediate aspiration. This washing and aspirating process should be frequently repeated until the wash water is clear and free from ingested poison. By use of the syringe the catheter is less likely to be blocked by food substances. If the poison has caused erosion of the mouth, pharynx or digestive tract the passage of a tube is contraindicated. In washing the stomach great care should be taken that food particles and poisonous substances are not aspirated from the pharynx into the lungs. It has been suggested that this accident may occur when the stomach is evacuated in kerosene poisoning, causing pneumonia; others think that if the oil remains long in the stomach it may be absorbed and partially eliminated through the respiratory organs, causing irritation and inflammation in these areas.

CONTRACTURE OF HAND AND MERCURIC CYANIDE DRESSING

To the Editor:—Can a solution of mercuric cyanide used as a wet dressing on an aluminum metacarpal splint cause a permanent deformity of the hand? I have a case in which mercuric cyanide was used as a wet dressing on an aluminum metacarpal splint for an infected hand. Later (within a few weeks) contracture of the hand developed, and now the patient is unable to close his hand completely. He was told by another physician that the cyanide solution caused the deformity. I should like to know if it is possible for the mercuric cyanide to react with the aluminum and produce the contracture of the hand that is now present.

M.D., North Carolina.

ANSWER.—There is no definite information which would permit an answer to this question. It seems extremely doubtful that a combination of mercuric cyanide as a wet dressing with an aluminum splint could be responsible for the injury. Why one should use a destructive chemical like mercuric cyanide in the treatment of a hand infection is difficult to determine.

STRYCHNINE SULFATE FOR NERVOUS MANIFESTATIONS OF ALCOHOLISM

To the Editor:—A colleague recently expressed himself in favor of strychnine sulfate for cases of delirium tremens and acute alcoholic delirium. The thesis of antagonism (chemical or physiologic) between alcohol and strychnine seems to me particularly untenable as a basis for therapy since a patient with delirium tremens may not be saturated with alcohol at the time.

A. Valdes Dapena, M.D., Havana, Cuba.

ANSWER.—A recent article (Perisson, J.: *Alcoolisme: Traitement des Complications Nerveuses par la Strychnine*, *Union méd du Canada* 72:317 [March] 1943) which discusses the treatment of the nervous manifestations of alcohol addiction by means of strychnine contains some startling statements: Huge doses of strychnine are given subcutaneously, the daily total used in the treatment of delirium tremens being as much as 50 mg. and the individual doses being as high as 10 mg. ($\frac{1}{6}$ grain). After two or three days the dosage may be reduced, but the treatment usually lasts from five to six weeks. Smaller doses of strychnine are used in chronic alcoholism, but about six weeks of treatment are again required. It is asserted that this treatment generally causes no untoward complications, since the alcoholic patient has a remarkable tolerance for strychnine, and that strychnine is an antidote for alcohol because it causes a functional antagonism to alcohol on the nervous centers. The article indicates, however, that strychnine has no effect in the case of a demented chronic alcoholic addict.

The rationale for this form of treatment may be questioned, since a person under the influence of alcohol will oxidize or eliminate all of his imbibed alcohol within twenty-four hours after stopping drinking. It is then no longer a question of combating the narcotic action of alcohol by strychnine. Actually there is usually a period of heightened nervous irritability following alcoholic excesses, which condition would be further aggravated by strychnine. It would be better even to give more alcohol! If the strychnine treatment should measure up to the claims made in the article cited, the good results might be due to the punitive regimen.

VITAMIN K AND PHLEBITIS IN LATE PREGNANCY

To the Editor:—A patient developed a phlebitis two weeks prior to delivery. She had been taking vitamin K for some two weeks previous to the development of the phlebitis. Could you tell me whether in a case like this vitamin K will tend to cause phlebitis?

C. N. Talley, M.D., Marlow, Okla.

ANSWER.—In therapeutic doses vitamin K has little if any effect on the coagulation of the blood of normal persons. There is no experimental or clinical evidence that the administration, even in large doses, of vitamin K is followed by phlebitis. Since thrombophlebitis is not too infrequent in pregnant women, one can state confidently that in a case like that described vitamin K would not be significant in the etiology of the phlebitis.

PAINFUL BURSAE AROUND ISCHIAL TUBEROSITY

To the Editor:—Is there any such term as "bursitis ischioglutealis"? This diagnosis was made for pain on the os pubis of one side on sitting, lasting now over some years with intermissions of months. Some years prior to the onset of pain there was prostatitis. Regular and repeated treatment was instituted and the prostate is all right now.

M.D., New York.

ANSWER.—There are several small bursal pouches in the region of the ischial tuberosity. As a result of repeated irritation and sometimes following a traumatic injury there may develop a pronounced bursal swelling with chronically thickened walls. This bursa is so placed between the ischial tuberosity and the gluteus muscle that it would seem quite correct to designate this as an ischioglutealis bursitis, although that term has not been used often enough to become generally well recognized.

ALKALIS FOR SCALDING HOGS

To the Editor:—On page 320 of the May 27, 1944 issue of *The Journal* there is a query regarding the use of lime in scalding hogs. In the reply it is stated that packing houses have discontinued the use of chemicals; that hogs are merely scalded in boiling water and sent through the dehairers. In this connection I want to say that alkalis still are used in all packing plants in the scalding tubs in order to cleanse the carcasses. As suggested by your inquirer, lime is used, as is also soda ash and sodium hydroxide. One authority suggests 100 pounds of pine tar, 10 pounds of caustic soda and 30 pounds of soda ash for a 3,500 gallon scalding tub. It is true, of course, that workmen do not come in contact with the scalding water except in raising the tendon of the hind shank. Scalding is not done at the boiling point as the reply suggests, but at 140-146 F. Dehairing is done with a mechanical device. Some shaving is usually necessary by hand to remove hairs which escaped the beaters.

William J. Loeffel, Lincoln, Neb.
Chairman, Animal Husbandry Department, University of Nebraska.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 3

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

SEPTEMBER 16, 1944

THE CHANGES IN OPERATIVE GYNECOLOGY DURING THE LAST QUARTER-CENTURY

CHAIRMAN'S ADDRESS

LOUIS E. PHANEUF, M.D., Sc.D.
BOSTON

Much progress has been made in the surgical technic of all specialties in the last twenty-five years. Mass ligation of tissues has been supplanted by careful dissection and the tying of individual vessels. Large suture material has been replaced by fine sutures, with better healing. The advocates of the silk technic have shown that, with careful hemostasis and the use of the finest threads, inflammatory reaction in wounds or incisions so treated is almost entirely absent. There are those—and they probably form the majority of operators—who prefer catgut to silk. Taking a leaf from the book of the silk advocates, they have gradually reduced the size of their catgut until now a No. 0 strand may be used in place of the former No. 2, this having been made possible by the improvement in the manufacture of catgut. With the decrease of foreign bodies in sutured wounds, the severe reaction and abundant serum previously found have been eliminated, resulting in better and more rapid healing. The painstaking dissection of the tissues, the employment of the finest sutures consistent with the amount of tension present and perfect hemostasis are the three general factors which have had the most to do with the improvement of surgery in general.

CARCINOMA OF THE UTERINE CERVIX

Twenty-five years ago radium and high voltage x-rays were just beginning to be selected in the treatment of carcinoma of the uterine cervix. Irradiation then was usually resorted to for the inoperable cases. The radical abdominal hysterectomy to which the name of Wertheim has become attached was the method of choice in the treatment of this malady. It was well known at this period that a simple panhysterectomy offered but little chance of a permanent cure, since in this operation the parametria, the pelvic connective tissue and the iliac glands were left undisturbed. The mortality of the Wertheim operation at this period was high, the fatalities being due in large part to shock, hemorrhage and infection, and the prevention and management of these conditions not being so well understood as they are today. Blood transfusion had not as yet come into its own, the facilities for blood transfusion in the average hospital were very meager to say the least, and in certain cases the blood transfusion,

if given at all, was more of an operation than the hysterectomy itself. The sulfonamide drugs used in the prevention of infection were of course unknown during the period under discussion. The Schauta vaginal hysterectomy for malignant disease of the cervix had but few adherents in America, surgeons here preferring the abdominal route. Considering the constant and rapid improvement in the technic of irradiation, with its low or absent mortality, simplicity of performance and primary results as good as or better than those of the Wertheim hysterectomy, it is not to be wondered at that the latter procedure was practically totally abandoned. As time has gone on and women treated by irradiation have been carefully followed over a period of many years, injuries of the large and small bowel the result of fibrosis resulting in intestinal obstruction at the end of fifteen to twenty years, according to some statistics, have averaged about 20 per cent. Again, deep and refractile ulcers of the bladder have been found after a number of years. This is no disparagement of radium and x-ray therapy, which doubtless have been used in most cases in the treatment of cervical cancer. As one of those who never entirely gave up radical pelvic surgery for irradiation, I have often wondered why an operation like the radical abdominal hysterectomy which had rendered such signal service could be absolutely abandoned. It has always seemed to me that there must be a place for it in the properly selected case. Recently a small number of gynecologists have reasoned along the same lines and have again turned to surgery in well selected cases. Those who are returning to the Wertheim operation today realize that the mortality must be kept at a low figure. This may be accomplished by selecting only group 1 cases, those of women in good physical condition; by cleaning the cervix and minimizing infection by a small preoperative dose of radium, when indicated; by preparing the patient carefully, paying particular attention to the blood; by the judicious use of whole blood and blood plasma transfusion preoperatively, intraoperatively and postoperatively, and by leaving the required amount of one of the sulfonamide drugs in the culdesac of Douglas after covering the raw areas with peritoneum. When this selection and technic are carefully followed, the convalescence of these women does not differ much from that of those who have been subjected to an ordinary panhysterectomy. Radium and high voltage x-rays are still reserved for some cases in group 1 and for groups 2 and 3, and are used as palliative agents in some group 4 cases. Diagnosis of early cancer of the cervix is one of the prominent achievements of the last quarter of a century.

CARCINOMA OF THE UTERINE CORPUS AND FUNDUS

In the management of corporal and fundal carcinoma no such radical change has taken place as in carcinoma of the cervix. A simple panhysterectomy with the

Read before the Section on Obstetrics and Gynecology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

ablation of the adnexa, with or without preoperative radium and postoperative high voltage x-ray therapy, has remained the treatment of choice. Improvement here has also come through early diagnosis. Malignant disease occurs in this area at a more advanced age than it does in the cervix. The advocacy of a diagnostic curettage for women who bleed irregularly at or after the menopause has been responsible for the recognition of the disease in its incipience. Even here irradiation has been of great benefit to a group of women advanced in age whose physical condition does not warrant as extensive an operation as a panhysterectomy. Although radium and x-rays have not shown such brilliant results in cylindric cell as in squamous cell cancer, nonetheless a sufficient number of patients with the condition have been benefited by this form of therapy.

UTERINE MYOMAS

Uterine fibroids are one of the commonest lesions in gynecology. During the last twenty-five years myomectomy has been resorted to with increased frequency. Originally it was thought that myomectomy on account of the increased dangers of hemorrhage and sepsis was a more serious operation than hysterectomy. Recent statistics have shown that through thorough asepsis and careful suturing these difficulties have been overcome, the mortality reported being no higher than that of supravaginal hysterectomy. The great advantage of myomectomy rests in the fact that the functions of menstruation and reproduction are not interfered with, an important desideratum in the younger group of women still in the childbearing age. All statistics show a rather large number of children born of women so treated. The continuance of menstruation is an important factor in the lives of these patients. The principles of supravaginal hysterectomy for fibroids were well established twenty-five years ago, and the results of this method were quite satisfactory. The conservation of the adnexa, when in a healthy state, in performing hysterectomy for myomas on women who have not reached the menopause is a principle accepted by most gynecologists. Our knowledge of the hormones of the ovary and of the fact that they continue their function of internal secretion for a certain period of time if a small amount of endometrium is retained at operation has led to conservation in this respect. That it is essential to maintain a good blood supply to the retained ovaries is a fact recognized by all operators.

The question of supravaginal hysterectomy versus panhysterectomy in the treatment of certain uterine lesions of benign origin in which fibroids play an important role has led to important debates before medical societies when the subject is brought up for discussion. An increasingly well planned and careful follow-up of patients has led to the discovery of a number of carcinomas of the retained cervical stump. It is argued by the protagonists of panhysterectomy that, if the cervix had been removed at the time of the original hysterectomy for fibroids or other benign conditions, carcinoma of the cervical stump could not have developed, a proposition that is absolutely logical and cannot be ignored. On the other hand, the advocates of supravaginal amputation of the uterus agree that the difference in mortality between panhysterectomy and supravaginal hysterectomy is greater than the incidence of stump carcinoma, that the vagina is shortened by panhysterectomy and that in the presence of a retained cervix more satisfactory marital relations may be permitted. In answering these allegations it

may be said that it is true that the mortality of panhysterectomy is considerably higher in the hands of those who perform this operation only occasionally, but the same cannot be said of well trained specialists and experts in its performance. A glance at the statistics for the last ten years seems to prove this point. If the vagina is carefully dissected around the cervix it is not shortened appreciably, and it must be admitted that retaining the cervix for purposes of marital relations is a sound argument and one difficult to refute. One step in the progress of supravaginal hysterectomy during the period under discussion has been the opportunity for careful examination of the cervix, with the aid of a good light, under anesthesia before proceeding with the operation, as benign lesions of the cervix should be healed before or treated at the time of the subtotal removal of the uterus. To accomplish this end many methods have been suggested. These include trachelorrhaphy, amputation, electrocoagulation and cauterization. I have tried all these and come to the conclusion that in my hands thorough cauterization of the cervical canal and portio vaginalis has given the best results. Moreover, the gynecologist in choosing the type of hysterectomy for benign lesions is influenced by the number of stump carcinomas which come to his attention. In my practice, in recent years, the total has almost entirely supplanted the subtotal operation.

In the last decade irradiation by means of radium or x-rays has achieved greater popularity in the treatment of fibroids, but if this method is resorted to it should be an inviolate rule to precede it by a thorough curettage of the uterus in order to rule out malignant disease. In the opinion of many, irradiation should be reserved for those considered poor surgical risks and for those who have reached the age where the ovaries have ceased to function. In the young, whose ovaries should be conserved, and in the good surgical risks, surgery is still accepted as the better method of treatment.

VAGINAL HYSTERECTOMY

The trend toward vaginal hysterectomy in the United States has become more prominent since 1919. Performed before the days of abdominal surgery because of its great safety, it was almost entirely abandoned at the beginning of the present century when abdominal pelvic surgery became popular. During the last two decades it has been reborn, so to speak, and its performance in all gynecologic services is now commonplace. In some clinics its indications have been extended to the point of removing large fibroid tumors by morcellation. Two schools of thought exist in connection with this operation, the first including those who favor the suture method and the second, a small group, sponsored by James W. Kennedy of Philadelphia, including those who favor an improved clamp method because of its simplicity and rapidity. Vaginal hysterectomy plays such an important role in gynecology that it is not likely to be again abandoned.

VESICOVAGINAL FISTULAS

Originally vesicovaginal fistulas were the result of the trauma of childbirth or of protracted labor, and with the exception of those adherent to the pubic rami the operative treatment was not especially difficult since they were usually accessible. With the increase in operations on the pelvic viscera, hysterectomy and operations on the anterior vaginal wall and bladder, for example, the so-called surgical fistulas now greatly outnumber the obstetric. Because of their location, especially those situated high in a scarred and retracted

vaginal vault, their closure may tax the ingenuity of the operator. As a result, vaginal, intravesical and intraperitoneal methods have been devised. Most of these fistulas, however, are operated on, by the gynecologist, through the vaginal approach. Two extremely helpful adjuncts to the operation, probably not resorted to frequently enough, are, first, the Schuchardt incision, which permits such excellent exposure of the upper third of the vagina, and, second, suprapubic cystostomy. The latter, constantly employed by the urologist, has received but little consideration from the gynecologist, who usually inserts a self-retaining catheter through the urethra to keep the bladder empty. In many cases the catheter rests and causes pressure on the recently repaired area. This may militate against healing, whereas draining the bladder suprapubically places the sutured area at rest and leaves it undisturbed. This method is so advantageous in difficult cases that I wonder why I did not resort to it much sooner. The silver wire suture recommended by J. Marion Sims still has a place in the repair of vesicovaginal fistulas. More recently the metallic alloy wire suture, recommended by W. Wayne Babcock, has received deserved attention because of its greater tensile strength and because of the possibility of tying instead of twisting the suture.

TRACHELORRHAPHY AND AMPUTATION OF THE CERVIX

Trachelorrhaphy and amputation of the cervix are still valuable operations, although trachelorrhaphy seems to be losing some of its popularity. The current and useful methods of cauterizing the cervix after each labor, thereby overcoming erosion and ectropion and healing the smaller lacerations, has resulted in the less frequent performance of these operations. It should be emphasized that high amputation of the cervix should not be performed on one who is expected to have more children because of the frequent resultant sterility, because of the increased incidence of abortion and because of the dystocia in subsequent labors.

UTERINE PROLAPSE: CYSTOCELE: RECTOCELE

During the last twenty-five years the progress in this branch of gynecologic surgery has come through a better understanding of the structures that hold the pelvic viscera in their normal position. The modern reconstructive operations are based on sound anatomic and physiologic principles. The supportive structures are exposed by layer dissection rather than by superficial dissection of the surface mucous membrane of the vagina. As might be expected, better operative results have been secured. The operations of uterine suspension and fixation of the uterus to the anterior abdominal wall have definitely decreased in frequency. It has been recognized that fixation of the uterus to the abdominal wall is contraindicated during the childbearing period. In treating women who have passed the menopause there has been a decided tendency to operate entirely through the vagina rather than by the combined vaginoabdominal method in vogue in the early part of the century.

PELVIC INFLAMMATORY DISEASE

Although numerous organisms may be etiologically responsible for pelvic inflammation, three large groups predominate: specific infection, caused by the gonococcus; tuberculous infection, and the large group of pelvic cellulitis for which the streptococcus is generally responsible. It is evident in all large gynecologic services that pelvic inflammation is decreasing. The

sulfonamide drugs are changing and may still further change the course of gonorrheal infection. It has been proved that these drugs limit the extension of the disease. For practical purposes gonorrheal infection in women may be divided into three stages: the initial infection involving the urethra, the vulvovaginal glands and the cervix; pelvic invasion, usually occurring at the time of menstruation, when the organisms attack the endometrium, the tubal mucosa, the ovary and the pelvic peritoneum; and the development of degenerative lesions resulting in hydrosalpinx, tubo-ovarian cyst, adhesions, fixed retroversion and the like.

The treatment of the first two stages is conservative, that of the third stage operative. If the sulfonamide drugs come up to expectations and if the infection is limited to the first stage, the treatment of gonorrhea in women may become entirely conservative and the extensive operative procedures carried out in the third stage may rarely occur. Tuberculosis of the female organs of generation has gradually diminished during the last twenty-five years, doubtless because of the systematically carried out prophylactic measures against the disease in general, its decreased incidence and its earlier recognition. This disorder does not play an important part in pelvic inflammatory disease today. Puerperal infection in the form of postabortal and postpartal pelvic cellulitis still demands the earnest efforts of the profession. Although prophylaxis has reduced the number of such infections, puerperal sepsis still heads the list of causes of maternal deaths in this country. Here again the prophylactic measures are beneficial and the sulfonamide drugs are proving to be valuable in arresting such infections, so that even here the operative treatment may be curtailed.

OVARIAN TUMORS

In connection with ovarian tumors, the progress established during the last two and a half decades has been due to better classification and the recognition of certain of the rare ovarian new growths. The significant work of Sampson and others has placed pelvic endometriosis on a sound basis. Although there is some disagreement regarding the etiology of endometriomas, gynecologists agree on the method of treatment. There are no great differences of opinion as to the operative management of ovarian tumors. It is the general opinion that small multiple cysts, follicular cysts and lutein cysts seldom need operative intervention. As far as the true neoplasms of the ovary are concerned, the opposite obtains, since a high percentage of the benign new growth are known to develop a certain degree of malignant degeneration and since it is obvious that the malignant ones should be operated on as soon as they are diagnosed. Whereas uterine myomas may be kept under observation, with safety, for an indefinite period of time—a significant number regressing at the time of the menopause—the same cannot be said of ovarian neoplasms because of the strong possibility of the development of malignant changes, slight or extensive. It is a safe rule, therefore, to follow the custom instituted many years ago—namely, that the treatment of ovarian neoplasms be operative and that operation be performed as soon as the diagnosis has been established.

SUMMARY

The last quarter of a century has shown significant improvement in surgical technic, with emphasis on careful dissection and ligation of individual vessels with fine material rather than mass ligation of tissues. The treatment of carcinoma of the cervix has changed from

surgery to irradiation with the return to the radical pelvic operation by a few gynecologists in early cases and good surgical risks. Carcinoma of the uterine corpus and fundus has remained a surgical lesion, surgery, however, having been complemented by irradiation. Improvement in the operation of myomectomy has resulted in more conservative management of these lesions in the young; supravaginal hysterectomy still remains the common method in use, while an increasing number of gynecologists have turned to panhysterectomy as a prophylactic means against carcinoma of the cervical stump. Vaginal hysterectomy has been reborn and improved and has now become a commonplace procedure. The increased number of surgical vesicovaginal fistulas has been responsible for the elaboration of new technics in the cure of this lesion.

Trachelorrhaphy and amputation of the cervix are less frequently done, these having been replaced in many cases by cauterization and electrocoagulation. A significant advance has been made in the surgical treatment of uterine prolapse, cystocele and rectocele through better anatomic understanding of these lesions and by reconstructing the deficient supports through the vagina rather than by depending on abdominal suspension or fixation of the uterus. Pelvic inflammatory disease has been handled more and more by conservative methods, and the sulfonamide drugs seem to show great promise in lessening and eradicating this condition. Ovarian tumors have been better classified, the rare tumors have been discovered, the tendency of malignant changes in these neoplasms has been emphasized and their early ablation has been strongly advised.

270 Commonwealth Avenue.

TREATMENT OF WAR NEUROSES

LIEUTENANT COLONEL ROY R. GRINKER

MEDICAL CORPS, ARMY OF THE UNITED STATES

Major Spiegel and I have described brief, dynamic psychotherapy as applied to various types of war neuroses.¹ We have indicated the standard technical methods found by experience to be the most effective in the treatment of typical cases. However, psychotherapy is always an individual procedure, variable for each patient, requiring on the part of the therapist not only scientific knowledge but skill or art and a sense of timing. The following steps are carried out in most cases:

1. Release of repressed emotions in a process of so-called "abreaction."
2. Support of the patient's weakened and regressed ego through identification with the therapist's strength.
3. Desensitization from the memories of the anxiety producing situations by repetitive recounting of traumatic experiences, as the therapist helps the ego to discriminate between past danger and present safety and between dangers of the world of reality and inner anxieties.
4. Neutralization of the severe superego reaction of guilt to the actual, or sense of, failure.

From the AAF Convalescent Center, Don Ce-Sar Place, St. Petersburg, Fla.

Read in a panel discussion on "Neuropsychiatry" in the General Scientific Meetings at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 13, 1944.

1. Grinker, R. R., and Spiegel, J. P.: War Neuroses in North Africa, the Tunisian Campaign (January-May, 1943), New York, Josiah Macy Jr. Foundation, September 1943; Narcosis: A Psychotherapeutic Method for Acute War Neuroses, Air Surgeon's Bull. (No. 2) 1:1 (Feb.) 1944; Brief Psychotherapy in War Neuroses, Management of Neuropsychiatric Casualties in Zone of Combat.² War Neuroses in Flying Personnel.³

5. Instilling insight into the relationship between the neurotic reactions to war and the past character and personality trends.

6. Encouraging the ego in its experimental attempts to regain mature attitudes and to attempt adult activities, thereby giving new confidence to the weakened and regressed personality.

In order to describe these procedures in a concrete fashion I have chosen to present an abstract of the actual therapeutic maneuvers in the treatment of one patient:

REPORT OF CASE

Depression with anxiety of one year's duration relieved by pentothal narcosis and brief psychotherapy in one week.

A captain aged 25, who was sent to the Convalescent Center because of objective symptoms of depression, presented an expressionless face; his muscles were quite rigid, indicating a great deal of tension. He did not volunteer much information and never smiled, and his speech was retarded. The patient had been a flight leader in a pursuit squadron and had fought successfully until about his twenty-fifth mission, when a friend who had been flying on his wing went up in flames. However, he stated that he continued fighting and successfully completed his tour of duty, although feeling bad and depressed. He returned to the United States, refusing the chance of remaining as commanding officer of a squadron. He had been reassigned to a job in the United States which he liked very much and wanted to keep, but his depression continued and was accompanied by severe startle reactions. When any one came into his room and made a sudden noise or turned on the light he would jump out of bed with great anxiety. In addition to the depression and its concomitants, there was considerable insomnia with battle dreams, which repeated some of the very severe traumatic incidents of his combat experiences. However, he maintained fairly good control of himself and continued to fly. He attempted to decrease the anxiety and depression by drinking, but the only result was an increase in anxiety. He stated that he tried hard to forget his experiences but found it impossible.

During this initial interview I learned that he was single, a university graduate who studied hard, made excellent grades and was given a fellowship in animal genetics which he could not continue because he entered the Air Forces. There was no history of any previous depression and no incident that showed that he could not adjust himself to his normal experiences and environment.

That afternoon I gave him 0.25 Gm. of pentothal sodium intravenously. He was then told that he was up in the air on a strafing mission and that the man on his wing was aflame, and then I commanded "Go ahead and talk." Immediately he went into an emotional reaction, shouting to his friend, whose name was Granny, to "pull up and bail out."

"Why doesn't he pull up, why doesn't he bail out? I hope he doesn't think it's my fault. He's such a nice boy. Such a swell fellow. I hope I'm not responsible for his death. We were together all the time. He lived in the same tent with me and would share anything that he had. When we were on low rations he would give as much as he could to every one else." Accompanying all this were tears and sobbing and repetitions of "I hope he doesn't think it's my fault. He wasn't a good flier. Oh, if I had only picked out another spot, a safer target, but that is where they told me to go, right over those trucks. If I had gone in some other place he wouldn't have got it. Why did he do it? He should have stayed in formation. He didn't stay where he was supposed to. He came up and took the lead position with me. Maybe I should have given a talk before we went, about staying in formation. Why didn't I do that?"

Then he talked about the letter they wrote home to Granny's family and how he couldn't bear to read it. That would start it all over again. "I can't get him out of my mind. I couldn't see his family because they probably had forgotten and I didn't want to stir them up." In this fashion he went over and over the traumatic situation, crying and sobbing.

This is the phase of abreaction.

As this reaction subsided he was allowed to close his eyes and sleep for a few moments. Then I handed him a light cigarette and awakened him. He looked at his watch and stated,

"I must have been asleep. I had a dream about Granny." His pillow was wet with tears. He said "Gosh, I perspired a lot."

I told him "No, you were asleep for only a few minutes but you talked to me about Granny and you told me all about it. Let's talk about him some more."

Then in a conscious state he went over the situation again, just as he had done when asleep, but one more bit of information was elicited; Granny was not appointed a regular flight leader because he was a mechanical flier; instead, the patient was given the job. Then the patient talked about another boy who crashed in a low level flight, maintaining radio silence according to instructions although he was in need of help. Then he told of feeling bad about killing the Germans. I ended the interview by telling him that he had assumed a responsibility for the death of Granny that did not seem to be based on fact.

Identification with the therapist and desensitization has begun.

The next morning the patient entered the interviewing room and stated "I feel like a load has been lifted from my mind, like a great relief. I slept well last night, awakened once and went right to sleep again. I had no dreams. This morning I feel good." There was a silence. Then he said "I guess I blamed myself unnecessarily." I said "Yes you did. Now let's try to figure out why you blamed yourself. Tell me something about your background." The patient then told me he lived on a farm of 650 acres. His father was a successful farmer who made enough to enable four children to go to college. The first child was born dead, the second was the patient and then there were two sisters each two years apart and the oldest two years younger than he. He had one brother nine years younger. The mother was very mild mannered and very religious. The children went to Sunday school and church, though not forced to do so. The father was very kind and gentle but strict in his attitudes. He rarely spanked the patient, but he expected him to live up to his responsibilities. If he did not, he would look pained and disappointed and tell him "This was your job," and then do it himself, which the patient stated was worse than a spanking. He was always on very good terms with his father and would rather work with him than any one else.

He then began to talk about his commanding officer and told how this man was an exceptionally strong leader; a person who went on the most dangerous missions himself; a man who was fair and expected every one to do his job.

I said to him "Your C. O. was very much like your father." The patient stated "You know, I often thought he was like my father, doing things he wasn't supposed to do and doing everything to help us but expecting the best from us. Of course not in the same way because he was a fighter." I said "Now let us summarize the things for which you blame yourself. Granny's death—but you were ordered to hit the target even though dangerous; you could do nothing else and could not be responsible for his death. Secondly, you blame yourself for not giving implicit formation instruction, but you were all experienced fliers and had been trained in formations for six months and every man knew his position. You blame yourself for killing the Germans but you know that was to save the lives of our own troops. You blame yourself for the boy who crashed on the low mission, but it was agreed beforehand that radio silence was to be maintained. You blame yourself for not communicating with Granny's family, but you know that it is not good to stir up a sorrowing family again. So you have a lot of disapproving attitudes toward things which are not really your fault. You behave as if you were still reacting to a disapproving attitude that your father might have had toward you. You behave as if your father's image were looking at you with a disappointed expression."

Here we see a beginning neutralization of a severe superego.

The patient said "Well, I have always taken responsibilities and duties seriously. I have never been able to feel that I did give my best unless I worked terribly hard."

Then I stated "And now your behavior, which is depressed and completely unhappy, is just as if you were intent on

punishing yourself and never letting yourself have any fun or pleasure."

The patient stated "That's it. I can't enjoy things. I wonder why I take his death so seriously." I stated "Yes, I wonder why" and terminated the interview.

The next day the patient entered the interview smiling and stated frankly "I must say I haven't felt so good as I feel now for a long time. I slept well and had no dreams." He felt as if he could carry on. He now realized that he took his responsibility too seriously but always had felt as if he didn't want to let any one down and then told about a younger pilot, 21 years of age, whom he had taught to fly formation. The younger pilot looked up to him as an older man or father. I said "Something like your younger brother," and he answered "Yes, he used to think I was a great guy. I taught him how to shoot, how to hold a gun and how to play all sorts of games. Our C. O. always spoke quite frankly about his opinion of the conduct and performance of the boys; he either disapproved or complimented. If a fellow did his work properly and if he asked for a day off he always got every consideration."

I explained to the patient then because of guilty feelings he was punishing himself for Granny's crash (which had happened one year before). I explained to him that this feeling had persisted without any cause in reality. Therefore, this sense of guilt and the punishment which he had been giving himself must be due to some inner feeling and that it was not possible to master such feelings unless we unearthed them and brought them to light.

I told him "Now you have told me nothing but good things about Granny, you told me how attached you were and what a fine fellow he was, but I think your guilty feelings about him are due to some negative attitudes toward Granny that you have not yet discussed. Perhaps these feelings were unconscious and a source of your sense of guilt."

This step is the beginning of the loosening of unconscious hostility derived from part of his precombat personality.

The patient then said "Of course no one is perfect, but Granny was the easiest person to get along with. He drank frequently and had to be taken care of. Once when we were in the desert and got drunk Granny tore up the tent in the middle of a sand storm. There was a family quarrel with the four tent mates."

I then drew his attention to the fact that Granny was not made flight leader. Was Granny envious of the patient? He reconstructed the flight; Granny was flying on the left wing of the patient, who was the leader. Granny flew on the left slightly behind, but he veered to the right and forward, to accompany the patient in the lead position. I asked him whether he interpreted this as if Granny were out to take the lead as a sort of rebellion. He said he didn't think so, but that he didn't give way because he wanted to maintain the proper formation in the flight. Then he said "Maybe that is why I feel so guilty, because I didn't give way." The result was that Granny was hit by flak and slid over the patient's plane to the right, on fire.

I told him "I think that there are some definite unconscious negative feelings toward Granny which might be responsible for your sense of guilt, and hence depression, and we will take that up in the morning."

The next morning the patient entered the room, at ease and in good spirits, and said "Colonel, I have been thinking a good deal about the situation of Granny, and some clue you gave me yesterday brought me to some sort of a conclusion. Probably it is silly, you might not think it is important, but I have been thinking about it." [When a patient says he is going to tell you something silly you prick up your ears because it is probably going to be the most important thing you will hear.] "I always decided that I wanted to do things and get ahead. I was very ambitious. I wanted to be better than just average and when I decided on any ambition I worked very hard to accomplish it. Sometimes I would win and sometimes I would lose but I would always work for whatever I wanted. When I was in school there were four of us on a cattle judging team. I wanted to be top man, but there was another fellow on the

team who lived with me and he was awfully good. I had to fight it out with him. We fought it back and forth all year round. In my junior year I was able to beat him. The next year he beat me. There were no hard feelings about it. It was competition but we still were friends."

The patient now begins to test his own inner attitudes in the light of reality.

The patient then repeated several other incidents of competitive relationship with other men and it became clear that he took no pleasure in winning over people who gave him no struggle. He always wanted to win out over some one who he felt was superior to him. "When I joined my outfit it was the same way. We had a C. O. who believed that the leadership in the squadron should come from the boys themselves. There were eight places for flight leaders and the men had to win the job. Even after a man became flight leader he had to work hard to keep it. We were always practicing, practically all the time. Two or three would go up and try to outfly one another. When we finally went overseas I wasn't able to take a lead position but I became an assistant flight leader. I was disappointed but worked hard just the same. Finally there were eight of us who were flight leaders, including Granny and myself. But we weren't always given the job of leading the flight. Our C. O. wanted to see how we were able to fly under somebody else's orders. We didn't always fly leader, we frequently flew wing. Once I went up with our C. O. to try to outfly him. I fought him hard and I beat him. When we came down I didn't say a word to anybody that I had beaten my C. O."

You now see how the patient has arrived at the logical conclusion without a direct interpretation. He has worked this thing out himself. There has been a certain amount of direction in the interview, but he has been able to think along the directed lines all by virtue of the fact that he has had an initial emotional release and ego support. But the release alone was not sufficient. He still didn't know the reason for the load of guilt that he had been carrying.

I then explained to the patient the nature of unconscious attitudes which were not tempered and modified by civilized realities; that our unconscious aggressions which arose from the instinctual depths within us were derived from our animal backgrounds. Sportsmanlike competition was a civilized modified type of aggression, but the real hostile competitive spirit is still based, as far as the unconscious is concerned, on the concept "to kill or to be killed." As a result, victory in competition would mean, unconsciously, as if the defeated person had been destroyed as the direct result of an unconscious wish to be rid of that person. Hence, when competition was followed by the death of an individual, the person felt actually as if he himself had killed that individual.

He grasped this interpretation and in the same interview was given another pentothal injection. He immediately started out by saying "I used to think I was responsible for Granny's death. I used to feel as if it were my fault. I know now that it is just one of those things that happen and I couldn't help it. He was a fine fellow. I was scared to go on that mission. He and I went into the mess hall that night for some supper, but we just nibbled; we couldn't eat. I had no cigarettes, but Granny had two packages and gave me one of them. I smoked half a package of cigarettes. Granny was generous like that. I was terribly nervous. It was a dangerous target, but off we went in a tight formation. There was a terrible amount of flak over the target. The trucks blew up and I felt good when I saw it. I don't know why Granny came over and tried to take the lead from me. I flew under his lead the day before and I stayed in formation. I can't understand why he broke formation and came up toward me and then got into a heavy flak position. But I didn't give

ground. I know now we were jealous of each other and we were really fighting against each other for the job."

When he awakened he felt a little dizzy and thought I had been sleeping. We summarized the whole material of the interview again before terminating the session.

The next day he came in and said he felt perfectly well. He slept soundly all night, had no dreams and felt that a great load had been lifted from him. He wants to go back to duty and feels he can carry on. When he went home for overseas leave his people recognized there was something the matter with him and didn't ask him any questions. The result was that he kept all the experiences to himself and deliberately tried to forget, but there was always that load on his stomach. He now understands that the only way one can forget is to suffer the pain of remembering first. He remembers episodes he thinks are funny and amusing, incidents that happened in his squadron overseas. He is beginning to remember and talk about little experiences. Prior to this he had not been able to think about these because they always led his mind into situations which became painful. "It is silly for intelligent people to let things bother them the way I did." His ego now has confidence in its strength and can dwell on the past without anxiety.

The question arises whether we should go on in further interviews and therapy to bring to consciousness the obvious unconscious hostility he had to his own father, or should we stop at this moment and return him to duty. We have been successful in removing the load on this man's personality which he has been carrying for a year. This load was the direct result of his combat experiences acting on his specific character and personality. As a result of the incorporation within his personality of the idealized figure of his father, we have a man who has been a successful student, a successful pilot and a successful leader. We can predict from this personality structure that he will probably continue to be successful in life. Along with this compulsiveness toward success we have to recognize the severity of his ego ideal, which would make him some trouble if he came into a situation in which he could not be successful, but we have already dislodged and disturbed that ideal. The therapy has been directed largely to weakening the severity of his father's attitudes to permit him to accept his repressed aggressions. That is the load that is off his chest. We can be assured that the loosening and easing of this pressure on him will continue perhaps to the extent that his ego ideal will be strong enough but not too severe. Therefore we did not treat him any further but returned him to duty. Six months later reexamination revealed him to be entirely well and competently performing his flying duties.

In the therapeutic process there was an initial loosening of the emotion, the substitution of a new, less severe superego and then the confrontation of the old guilt with reality, which forced the patient to look inside himself for the source of his reaction. It might be said in many cases that it is harder for a man to face his own unconscious than to face the fire of the enemy, but it must be endured if recovery is desired.

Overseas we were concerned with the direct and demonstrable effect of combat.² In the time that elapses before these men return to the United States a change seems to take place in the pattern of the neuroses. Old

2. Grinker, R. R., and Spiegel, J. P.: *The Management of Neuro-psychiatric Casualties in the Zone of Combat*, in Solomon, H. C., and Yakovlev, P. I.: *Manual of Military Neuro-psychiatry*, Philadelphia: Saunders Company, 1944; *War Neuroses in North Africa*.

patterns of neurotic behavior seem to engulf the newer reactions, and the total picture stands out sharply. The reaction to war is seen to be a repetition of old reactions to previous conflicts.³ There are no great resistances against the release of the old attitudes which have been mobilized by the new war situation. Hence our therapeutic achievements are frequently more than a removal of recently developed anxiety but often include an unexpected beneficial reorientation of the total personality. The technics are not difficult nor are they lengthy, but they require a thorough knowledge of the dynamic forces operating in human personality.⁴

THE MANAGEMENT OF HEAD AND SPINAL CORD INJURIES IN THE ARMY

MAJOR WILLIAM H. EVERTS

Chief, Neurology Branch, Office of the Surgeon General
AND

MAJOR BARNES WOODHALL

Chief, Neurosurgical Section, Walter Reed General Hospital
MEDICAL CORPS, ARMY OF THE UNITED STATES

The management of head and spinal cord injuries can never be a stereotyped, fixed method in the army. The type and degree of injury, nature of the traumatizing agent, mechanism of the trauma and circumstances under which initial care must be rendered vary so much that good clinical judgment rather than strict procedure is the all important factor in care of such injuries. The echelon for care of these cases in combat is the same for all types of trauma. The wounded soldier passes through the battalion aid station and clearing station of the division, and thence back to an evacuation hospital. A field hospital unit may, under some circumstances, be attached to the clearing station for the definitive attention of the most seriously wounded, but usually such detailed care is rendered at the evacuation hospital. From any one of these medical stations the soldier may be returned to duty with his own unit after receiving necessary care. Patients who cannot be promptly restored to a duty status or any who need prolonged medical care are sent back to a general hospital, from which those who are ultimately restored to a duty status are sent to replacement depots for reassignment as casuats to other units. Those who are unfit for any duty or for foreign duty are returned to our named general hospitals in the United States. Most of the latter hospitals are rehabilitation centers where any and all definitive medical and surgical attention can be rendered to our troops. From this echelon, troops are either discharged from the army after receiving maximum hospital benefit or are sent to special convalescent and reconditioning centers to be restored to a duty status.

The management of head and spine injuries in the overseas noncombat areas is essentially like that in the American zone of the interior; viz., hospitalized and definitively treated promptly without the factor of rearward movement away from combat area.

HEAD INJURY

The general size of the head injury problem may be ascertained from a review of battle casualties for the year 1941-1942. For that year head injuries made up 5.9 per cent of all wounds sustained. This figure would, of course, be slightly higher if one included those killed in action, for, in those, wounds of head, chest and abdomen run high. In general, then, it may be said that 6 of every 100 battle casualties are head injuries. If we break this down further, we note that slightly more than three fourths of this total group are closed head injuries with or without a simple skull fracture and the remainder are open head injuries of varying severity.

Closed head injuries in all echelons receive conservative therapy, varying according to the necessity or judgment of the medical officer. During the acute phase in the first seventy-two hours the patient is placed on a modest fluid intake, 1,500 to 2,000 cc., and a light diet. A lumbar puncture may be done if deemed therapeutically necessary; otherwise it is usually not done until after the first forty-eight to seventy-two hours, when it may be desirous to know the pressure and whether fluid is blood stained. Sedatives are used with caution, since a simulated stupor can easily be produced in this acute phase following a concussion, or again it may mask bleeding. Hypertonic solutions are not used routinely but are used when edema is evident and producing symptoms after the first day or two of injury. Normal serum albumin is probably the best hypertonic solution and has been widely distributed through army hospitals. X-ray films of the skull are always taken, but until the patient's shock and primary condition is first treated, films are withheld for the first day or two, unless there are very pertinent reasons why an x-ray should be taken sooner. In some of the forward stations closed head injuries have been evacuated in ambulatory fashion as soon as clearly conscious. In general, however, the usual program of bed rest is immediately instituted and maintained for two or three or more weeks according to the severity of the head injury, the latter judgment being based on the duration of loss of consciousness and the degree of disturbance in the temperature, pulse, respirations, pupillary abnormalities and focal neurologic signs. The same criteria are also utilized prognostically as to whether the soldier will be rehabilitated for duty or returned to the zone of the interior. A number of installations here at home have carried out a somewhat more active program in management of the closed head injury group and with gratifying success; viz., starting rehabilitation soon after stabilized, clear consciousness is regained. Thus, in milder cases latrine privileges may be permitted after the first twenty-four to seventy-two hours and then a graduated program of activity over a period of the next ten days with return to light duty in about two weeks and full duty in six. Incidence of post-traumatic syndromes appeared especially low when treated in this manner.

We have observed that patients having mild head injuries are often more likely to complain of headache, dizziness, insomnia, irritability and trouble in concentrating than those receiving a more severe injury. Also it must be remembered that treating a head injury patient who may be emotionally unstable, in an overseas theater, is just a bit different prognostically at least from treating the same patient here at home, since the element of secondary gain is a potent factor in production of a neurosis in many of these overseas cases. Particularly does one see this in the group alleged or

³ Grinker, R. R., and Spiegel, J. P. War Neuroses in Flying Personnel Overseas and After Return to the United States, *Am J Psychiat*, to be published.

⁴ Grinker, R. R., and Spiegel, J. P. Brief Psychotherapy in War Neuroses, *J. Psychosom. Med* 6:123 (April) 1944.

Read before the American Neurological Association, New York, May 19, 1944.

Read in a panel discussion on "Neuropsychiatry" in the General Scientific Meetings at the Ninety Fourth Annual Session of the American Medical Association, Chicago, June 13, 1944.

actually to have suffered a concussion due to blast. Many of those returning from overseas allege blast concussion as a cause of their persistent headache and associated nervous symptoms. As a matter of fact, concussion due to blast is quite unusual. The individual who has suffered organic brain damage due to blast invariably gives a history of having his breath knocked out, of coughing up bloody sputum, bleeding from the ears and nose and a period of complete loss of consciousness. On examination, these soldiers show flash burns, fissuring of the skin, perforated or hemorrhagic eardrums, conjunctival hemorrhage, signs of intrathoracic or abdominal pathologic changes and focal or general signs of organic damage to the central nervous system. All head injuries receive a most painstaking neurologic survey in the general hospitals, including electroencephalography, pneumoencephalography as indicated, mental tests and psychiatric studies during the course of hospitalization.

As for the outcome of closed head injuries, we have no definite overall figures. However, we do have data on several series of sufficient size to get a fairly good picture of what is happening to this group. In one overseas series of 131 patients, 79 per cent returned to full duty after an average hospitalization of twenty-five days, 15 per cent developed post-traumatic syndromes for which they were evacuated to the zone of the interior, and 6 per cent were still being rehabilitated. Of the group that are returned to the zone of the interior, the majority are discharged from the army, many with a pronounced psychogenic display, others with post-traumatic encephalopathies of such degree that they could not be rehabilitated for duty. Approximately the same statistics apply to the continental head injury group as far as we can ascertain, though again we have no accurate data on this.

Open head injuries comprise about one fifth of all head injuries. Few statistics are available at present concerning mortality or morbidity rates in head injuries caused by missiles in the American army personnel. In one series of 22 acute craniocerebral injuries of open type (dura torn, cortex injured, metallic fragments in the brain and several with grossly damaged brain and osteomyelitis of the skull) there were no deaths after operation. 36 per cent were returned to duty, 59 per cent were evacuated to the zone of the interior and 5 per cent remained in the hospital under continued rehabilitation after a period of sixty-eight days.

In all probability, our overall figures will compare favorably with those mortality rates reported by the British. Eden,¹ in his posthumous paper, gave a mortality of 23.6 per cent in 102 penetrating wounds of the brain and but one death in 208 nonpenetrating injuries. Ascroft² has reported a 15 per cent mortality in 292 penetrating injuries and two deaths in 224 nonpenetrating cranial wounds. In the American forces, serious head injuries sustained in combat are given early definitive treatment either in field hospitals manned by skilled auxiliary surgical units or more often in evacuation hospitals by trained neurosurgeons. The most important complication remaining is that of infection, particularly in those cases in which early and complete débridement of cranial wounds has not been accomplished. In Eden's and Ascroft's series, fatal infection supervened in 3.7 per cent and 10.8 per

cent respectively of patients operated on. This may be compared with the figure of 36.5 per cent in Cushing's series of grave head wounds treated on the western front in 1918. British experience has suggested also that chemotherapy with sulfonamides in fresh wounds does not reduce incidence of infection when débridement is delayed.

Two new substances, penicillin for control of infection and fibrin foam for control of hemorrhage, are now receiving clinical trial under combat conditions. In the battle of Sicily, 25 cases of cranial wounds infected from three to eight days were treated with penicillin by British neurosurgeons.³ Two patients died a few hours after admission to the hospital, and there was a total of five deaths, a remarkably low mortality rate. Obviously, penicillin therapy in such grave infections is a promising method of adjuvant treatment. In 13 brain abscesses and similar formidable cranial infections treated with the aid of penicillin at Walter Reed General Hospital during the past year, there were only three deaths. In these cases it was proved conclusively to attending surgeons that surgical drainage must be continued during the period of penicillin therapy and that penicillin therapy alone is inadequate.

Fibrin foam⁴ for control of hemorrhage from central and peripheral nervous systems has been used at Walter Reed General Hospital in approximately 200 cases, including such operations as formal craniotomies for tumor, repair of skull defects, compound depressed fractures of the skull with cerebral laceration and in peripheral nerve anastomoses and grafts. It is a promising method of hemorrhage control, particularly from the brain that has been lacerated by trauma or operative manipulation. As the supply increases, overseas neurosurgical units will be supplied and cerebral débridement will be especially facilitated by its use.

When the patient with a healed open head injury reaches the zone of the interior and is admitted to one of our neurosurgical centers, he presents one of two problems, and frequently both. The first comprises an evaluation of the extent of the existing cerebral injury in relation to future military duty or to disposition to another status. This is carried out by detailed neurologic and psychologic studies augmented by electroencephalography and pneumoencephalography. The second problem is that of repairing skull defects in otherwise recovered individuals for the purpose of completing rehabilitation for duty. The repair of such skull defects with tantalum plates 0.015 inch in thickness, by inlay or other technics, has been accomplished on 35 patients at Walter Reed General Hospital during the past year. Half of these patients have thus far returned to a duty status.

Before the skull defect is repaired, evaluation of the existing cerebral scar is attempted. In none of these cases was post-traumatic epilepsy a feature and, indeed, this complication of an open head injury has thus far been of minor significance. Records of cortical electrical activity taken through the tantalum plates are unchanged when compared with preoperative records. There is no technical aspect of tantalum plating that would preclude craniotomy for resection of an epileptogenic scar at a later date. Prophylactic excision of such scars is not considered feasible.

1. Eden, K.: *Mechanics of Neurosurgery in Warfare: Experience in the Eighth Army: Campaigns in Cyrenaica, Tripolitania and Tunisia*, *Lancet* 2: 639 (Dec. 4) 1943.
2. Ascroft, P. R.: *Neurosurgical Experience in Egypt and Libya*, *Arch. Neurol. & Psychiat.* 51: 295 (March) 1944.

3. Cairns, H.: *Gunshot Wound of the Head in the Acute Stage*, *Brit. M. J.* 1: 33 (Jan. 8) 1944.

4. Ingraham, I. D., and Bailey, O. T.: *The Use of Products Prepared from Human Fibrinogen and Human Thrombin in Neurosurgery*, *J. Neurosurg.* 1: 23 (Jan.) 1944.

SPINAL CORD INJURIES

Spinal cord injuries constitute slightly less than 1 per cent of all battle casualties. No compilation of data is yet available. From one very carefully studied series of 41 cases incurred in battle zones,⁵ some pertinent information may be drawn. Eighty-five per cent of this group were incurred in battle, 15 per cent in combat zone accidents. Over one half occurred in the infantry (infantry 15 per cent, field artillery 19 per cent, armored division 10 per cent, medical corps 5 per cent, engineering corps 5 per cent and all other units 15 per cent), one half occurred in the thoracic spine (cervical 7.5 per cent, thoracic 55 per cent, lumbar 35 per cent, sacral 2.5 per cent), three fourths were caused by foreign bodies (shell fragments twice as often as bullets) and the remainder by fracture. Sixty per cent of those caused by fracture occurred at the 1st lumbar and the remaining 40 per cent very nearby (9th, 11th and 12th thoracic).

Incomplete lesions of the cord were more common than complete lesions, this referring to a functional and not an anatomic lesion. Lumbar lesions were the least serious, since often it was a compression fracture and only a root involvement in this region. Sensory examination was the most accurate guide as to the level and bladder signs the best guide as to severity of the lesion; this was also a good indication for the urgency of operation. Bedsores developed in cord injuries at any level but most frequently in the complete cord lesions in anesthetic areas. X-ray examinations were a preoperative necessity, though often they did not fully indicate the degree of bony damage. Spinal manometric tests were of value in determining whether and when to operate. Of the 10 cases of fracture, 5 showed a complete block and 3 incomplete; in 2 no spinal tests were performed. The period of elapsed time from injury to surgery in these more severe lesions of the cord varied from eight hours to several weeks, the delay for the most part being due to other severe injuries, presence of infections, late onset of symptoms and, in a few, slow evacuation to the hospital. Operation was performed in a total of 31 cases, of which 12 were complete and 19 were incomplete lesions. There was improvement in all incomplete lesions operated on and no improvement in any of those that were complete. Of those in which operation was not performed, improvement occurred in 1 incomplete case and none of the complete showed improvement. Best results were obtained in those cases in which the pathologic condition was mostly extradural. No definite correlation could be made between good results and a short time interval for operation, since the cord showed a surprising ability to recover after long intervals in the incomplete lesions. The reasons for operation on complete lesions were cerebrospinal fluid leaks, presence of block and x-ray evidence of cord compression. There was a total of four deaths in this group of patients. All were complete lesions of the cord, and death was due to pneumonia and lung abscess in 1 (at the level of the 2d thoracic), pulmonary emboli in 2 (level of 6th and 12th thoracic) and the fourth patient, with a lesion at the 12th thoracic, died three months after injury, no postmortem being done.

From these cases it was learned that spinal cord injuries suffered mostly from the chain of evacuation. It was not so much the number of hospitalizations but the time spent in traveling which was so damaging to

cord injuries. Bedsores developed frequently during postoperative evacuation or enlarged rapidly if already present. Circular casts were wholly unsatisfactory, and only bivalved casts are now being used during transportation. The majority of such injuries reach the zone of the interior for convalescence and disposition in a stable neurologic status. The original wounds are healed and definitive surgery has been accomplished. In addition to a reevaluation of the neurologic status, there remain the problems of bladder infection, decubitus ulcers and supportive nursing care in particular cases.

It is unwise to assume in every instance that the need for restorative neurosurgery has passed. Decompressive laminectomy is futile in late lesions of the spinal cord proper but may be of benefit in the region of the cauda equina. In 2 instances of compression of the cauda equina by incompletely reduced dislocations of the lumbar vertebrae, laminectomy performed at Walter Reed General Hospital has relieved pain and possibly played a role in a subsequent tardy and partial restoration of function. In 1 instance of complete section of the cauda equina by a missile, extremity pain was reduced in intensity by neurolysis of the extensive scar. Stabilization of a fracture-dislocation of the cervical spine may be necessary. In a rehabilitation hospital, however, the major task of definitive neurosurgery has passed.

Primary among the problems besetting the spinal injury is that of bladder dysfunction and subsequent bladder infection. Patients are received with indwelling urethral catheters or with perineal urethrostomies or suprapubic cystostomies. The duration of transport and concomitant difficulties of treatment during this period of time may impair the efficacy of urethral drainage. At Walter Reed General Hospital⁶ tidal irrigation is practiced through a urethral catheter with maximum and minimum pressure of 12 and 6 mm. of mercury, boric acid being used as an irrigating medium. In cases requiring long continued drainage, perineal urethrostomy is performed. Suprapubic cystostomy is reserved for those cases in which urethrostomy is not practical because of stricture, large vesical calculus formation or prostatic abscess. Repeated cystometry is done for evaluation of returning bladder reflex activity.

The use of the Stryker turning frame has prevented the occurrence of fresh decubitus ulcers, promoted the healing of those already present and facilitated to a profound degree the nursing care of these patients. Suspension of the feet, freeing them from contact with the frame or bedclothes, and frequent and effortless turning of the patient promote nutrition and healing of pressure areas. Bed linen change offers no problem on such a frame. Physical therapy of the affected musculature is made easy by the height of the frame and the ease of turning the patient. The frame may be transported readily for x-ray studies and, finally, all necessary nursing and therapeutic movement of the patient may be accomplished by a single attendant.

Early grafting of the decubitus ulcer after surgical and chemical cleansing of the wound reduces bacterial infection and concomitant drain on the patient's resources. Such massive grafting has been carried out with split thickness grafts secured with the Padgett dermatome. Although denervated grafts are peculiarly susceptible to the adverse influences of soiling and pressure, they do well with the aid of the Stryker frame.

5. Klemperer, W.: Statistical Report on Spinal Cord Injuries, *M. Bull. N. Africa Theater of Operations* 1: 12 (March) 1944.

6. Lewis, L. G.: Treatment of the Neurogenic Bladder After Acute Spinal Injury, *S. Clin. North America* 23: 1505 (Dec.) 1943.

Rehabilitation is in part carried out by the physical therapy department and later in the reconditioning programs for those being prepared for a return to duty. Otherwise, when maximum hospital benefit has been achieved, they are discharged to their homes or to a Veteran's facility. Certainly it cannot be said that any striking advance has been made in the late care of spinal cord injuries, yet application of the factors noted has reduced the subjective distress of these unfortunate individuals and made possible their continued care in large numbers.

SUMMARY

It may be said that head and spine injuries occur with moderate frequency in modern war and present a serious problem of management when they are of the open type head injuries or more severe variety of spinal injuries. The description of the echelons of evacuation and the management at each level has made it apparent that early skilled medical attention is rendered to all acute craniocerebral and spinal injuries in every echelon. In general, it may be said that closed head injuries do best if given early progressive activation and early return to light duty. The more unstable of this group thus do not as readily become ensnared in a compensating neurosis. Open head injuries remain a problem from the standpoint of degree of encephalopathy and repair of skull defects. The medical department has anticipated the ever increasing problem of head and spine injuries with the rising tempo of the war, and as time goes on more data regarding definitive treatment and general management will be forthcoming.

PSYCHIATRIC EVALUATION OF THOSE RETURNING FROM COMBAT

LIEUTENANT COLONEL JOHN M. MURRAY

Consultant in Neuropsychiatry, Office of the Air Surgeon
MEDICAL CORPS, ARMY OF THE UNITED STATES

Reports from overseas theaters indicate that the incidence of psychoneurotic manifestations induced by the physical and emotional stresses of war are frequent occurrences. In the theaters of operation various technics have been devised for the management of these cases with due regard for the severity of the illness and the difficulties of therapeutic endeavors under trying local situations. Oftentimes mere rest and reassurance restore to active duty the men with less severe reactions. Other more serious cases are rehabilitated for non-combat duty in the rear of the fighting lines in the theaters of operation. Still other cases are of such severity that return to this country is necessary. As the war goes on the occurrence of these cases will probably continue. There are also large numbers of men who have completed a prescribed tour of duty in the theaters of operation and who, pursuant to War Department policies, are rotated back to this country. A certain percentage of these men show evidences of persistent symptoms akin to those common in civilian psychoneurotic illness. It is clearly evident that the problem of the care of these men is a most important and pressing one and that our programs for this care will soon need to be fully developed.

The Army Air Forces found it necessary early in the war to adopt a rotation policy for its flying crews. The dangers and hardships of modern combat flying are so great that practically all authorities of the A. A. F. and the R. A. F. were in agreement on this need. The human machine can stand just so much and then it needs a period of "being put out to pasture." A certain percentage of these men returning from overseas on rotation policy showed evidence of persistent psychoneurotic symptoms. This state is diagnosed at this time as "operational fatigue," which is by definition a reactive state resulting from the physical and emotional stress of continued danger and hardships. The intensity of operational fatigue may vary from minimal reactions to severe emotional disturbances. Minimal reactions are normal to these stresses and are not clinically significant. Operational fatigue is used as a diagnostic term for the following reasons:

(a) The term neurosis or psychoneurosis ordinarily denotes the presence of symptoms which are basically dependent on unconscious conflicts which arose early in childhood.

(b) Operational fatigue is basically dependent on recent situational experiences and conflicts and, as seen at present, has not yet become irreversibly bound to earlier unresolved conflicts over instinctual expressions.

(c) Although there is often a close similarity in the clinical manifestations of operational fatigue and psychoneurosis, the differences mentioned warrant the use of a distinguishing term for those cases which fall in the former category. Later the reactions may spread to and involve earlier residuals and thereby justify the latter diagnosis.

The term "operational fatigue" as used does not denote the existence of an organic factor as a specific agent nor does it implicitly or explicitly deny the basic importance of psychologic conflict in the production of the state designated. Some authorities deny the validity of these reasons for the use of the term "operational fatigue" and feel that organically minded opponents of dynamic psychiatry may use this to deny the essential psychologic origin of the illness as was done by the use of the term "shell shock" in World War I. This truly need not be the case; although there is definitely a factor of fatigue in the production of these states, the exhaustion indeed is an emotional one which is dependent on the situation of living beyond one's psychologic means for long periods of time. Finally the weakened ego has lost the ability to suppress and repress the normal fear reactions. This control mechanism has played itself out. Physical factors play an accessory role but are definitely not the primary ones. At this phase the anxiety responses come in to overwhelm the tired ego and produce the classic syndrome. And so it is believed that there need be no confusion in an essentially dynamic conception of this syndrome because of its designation of operational fatigue.

These cases diagnosed "operational fatigue" after completion of the combat tour, plus the definite psychoneuroses which broke out during the prescribed duty tour, plus the group of acute anxiety states which occurred in normal men on account of the overwhelmingly severe or repeated traumatic experiences in combat, gave the Air Surgeon's Office serious problems of psychiatric care and management some months ago. In order to meet this problem effectively the Army Air Forces has organized a Personnel Distribution Command. The mission of this command is to examine properly, evaluate and care for overseas returnees, excepting the cases of injuries and physical illnesses. This command also supervises and operates the A. A. F.

Officers Replacement Pool and supervises and operates rest camps and convalescent hospitals and centers to which A. A. F. personnel are sent for definitive psychiatric care, convalescence and convalescent training, and subsequent reclassification and reassignment to military duty. It also conducts personnel functions and activities required to effect demobilization of military personnel of the A. A. F.

In order to effect this program, redistribution stations are organized to which overseas returnees are sent for a complete medical and psychiatric examination, so that the effect of the war on these men physically and emotionally is accurately determined. Adequate treatment for the restoration to reasonable health of those men who have been injured by the effects of war is promptly instituted. Discharge or retirement is recommended for those who are too sick to be quickly rehabilitated. For dispositional and treatment procedures, the emotional disorders are diagnosed as operational fatigue and classified as:

(a) Severe. Hospital centers are organized for the definitive psychiatric treatment of cases so diagnosed. These centers utilize all forms of definitive psychiatric care known to be valuable as aids in the recovery and rehabilitation of persons so suffering. These centers will also be used as teaching facilities, as outlined later.

(b) Moderate. Convalescent centers are organized for the care of moderate operational fatigue. Here the unwinding, retraining and rehabilitation of soldiers within the military setting are carried out. This program consists essentially of ego strengthening and supporting procedures rather than definitive psychiatric care. A mental hygiene unit is established at each post so utilized.

(c) Mild. These cases are not of clinical significance. It is felt that the return to duty in a new unit will be adequate to institute the recovery of these men.

The greatest current difficulty in the development of this program is the scarcity of competently trained psychiatric personnel. This handicap has been met by the institution of a comprehensive program of teaching by "training on the job" methods. All efforts should be focused on understanding the clinical and therapeutic angles of the types of psychoneurosis which are arising in the war and are being sent to the zone of the interior for evaluation and treatment. There are four essentials in the success of this program:

1. Organization of combined training-treatment centers as outlined, where the teaching program has available numbers of soldiers with reversible war neuroses. The handling of this clinical material is the basis of the training program.

2. Selection of competent physicians for this training. These men are selected from the group of doctors who are being returned from overseas assignments with fighting units and who, by their war experience, have acquired a definite intellectual hunger for further training and understanding of those problems they have encountered in their front line experience. They must have demonstrated their interest in these problems and certain fundamental capacities for understanding and caring for these types of illnesses. These men are readily selected in one interview by a psychiatrist with experience in teaching post-graduate psychiatry. According to the War Department policy of rotation, numbers of these men are now returning from overseas and will be available for such future training and assignments. These men so selected are sent to the combined training-teaching center, where, under the control of top notch clinical psychiatrists in both the therapeutic and teaching spheres, they receive a course of perhaps eight to ten weeks' intensive instruction in the diagnosis, theory and technics found most useful in the management of these special problems.

3. Assignment to these centers of carefully selected psychiatrists as therapists and teachers. These instructors must have had special training and developed competence for this

particular field of psychiatric endeavor. This is doubly important, as these men must have had enough premilitary clinical psychiatric experience in the care and treatment of the psychoneuroses to reevaluate the old and organize new treatment procedures for this special type of psychiatric problem as current experience shows new technics to be of value. In this manner the most comprehensive and effective therapeutic regimen should be developed.

4. Supervision of these trainees after their assignment to duty as examiners in redistribution stations or as psychiatric assistants in treatment centers, which must be maintained by qualified and experienced psychiatrists. In this way their work will be more effective and a continued training program will be conducted as part of their daily routine.

There are numbers of well qualified psychiatric social workers and clinical psychologists available for utilization in this redistribution and rehabilitation program. These men, classified as Spec. numbers 263 and 289, should be made available readily to take their place in the organization of these centers. In these centers there must be adequate mental hygiene facilities and adequate classification units for proper job classification and placement. A competent Red Cross setup and adequate liaison with the United States Employment Service are essential to the program.

From this discussion it can be seen that the psychiatric program organized for the care of returned overseas soldiers depends essentially on our ability to select and train competent doctors with little or no previous psychiatric training to fulfil the need for junior psychiatric officers in this emergency. The proper selection and training of these men is both the keystone and the cornerstone of the whole program.

The Army Air Forces has found that men who have been overseas and have seen the acute anxiety reactions to battle experiences in statu nascendi have developed, in many cases, a powerfully keen desire for more knowledge and further training in a field of medicine for which their earlier training had poorly prepared them. In one interview it is not a difficult matter to select the doctor who has responded in a positive way to those needs which arose in the heat of the battle situation and who intuitively devised his own technics and ways and means of meeting these situations effectively. With this powerful desire for knowledge and further training, such men have proved to be excellent material for training in psychiatry and take amazing advantage of educational opportunities presented to them. One is agreeably surprised when listening to the high quality of the discussions evoked from a clinical seminar group of these men who have been at work in a hospital as ward clerks with a few hours of lectures and seminars per day for a period of only a few weeks. Such experiences demonstrate that this group is the best available source from which to select those physicians most competent and capable of being trained for the duties essential to the success of the psychiatric program.

Following selection, the nature and type of the training to be given is the next most important consideration. These officers are to be trained on the job. They are brought into the treatment centers as ward assistants and their time, excepting for a few hours daily in lectures and clinical seminars, is spent in the care and treatment of sick people. The teaching program is directed essentially to the clinical aspects of dynamic psychiatry. What these men need to know are the clinical, diagnostic, theoretical and therapeutic aspects of psychoneuroses. In this emergency we must be willing to accept a competence limited to this special angle of psychiatry. We cannot hope to indoctrinate the men

with broader aspects of neurology and psychiatry. These men will have to take care of psychoneuroses which have arisen as a result of the acute stresses of the battle situation. The illnesses which they are called on to manage are essentially dependent on the terrific impact of the environmental stresses on their patients. An understanding of the conflicts so produced and the anxiety reactions to these conflicts, which are the basis of symptom formation, are the matters that these men need to know to be valuable to us in this acute situation. Although it may be desirable to have a knowledge of neuroanatomy, neurophysiology and pathology in the peacetime training of the competent psychiatrist, one must realize that in this crisis we cannot have comprehensively trained psychiatrists in adequate numbers. Such well trained men must be used in the program as teachers, supervisors and consultants to the younger men.

At this time all of our efforts for teaching and training the men who are needed so badly for this special task may well be directed to understanding the elements which are specifically the fundamental and essential ones in the creation of the types of illnesses under consideration. Experienced consultants in psychiatry, with a sound comprehensive training, should always be available to the students for problems which are unusual and for guidance and help in developing competence in meeting routine situations. The principles of training recommended here are ones which one does not like to accept in general postgraduate psychiatric training, but at this time the need for fairly competent men quickly trained for this special job is the all impelling motive. A specialist is seldom competent in his chosen field unless his knowledge rests on a sound base of broad clinical training and experience. That must always be so; but we are not trying to train specialists.

A note may be borrowed at this time from an important experience of the Army Air Forces earlier in the war. At that time literally tens of thousands of mechanics were needed to service the tremendous numbers of fighting planes in foreign theaters. This was indeed a colossal problem in view of the intricacies of these modern fighting monsters. Old time mechanics would wish at least three years to train an apprentice competently in such highly specialized work, but new "on the job" training technics were devised—new means of hewing closely to the line of the pure essentials needed for the completion of the task at hand. The thousands of planes which rise to the skies in all of our battle fronts throughout the world daily testify to the success of the conception and execution of this training program. The mechanics have met the requirements from that training. They keep the ships flying, and the combat crews keep the bombs dropping. This is a good example of the old adage that the "proof of the pudding is the eating." These men were trained in three months instead of three years.

At this time a leaf may be taken from the book of this experience. Mechanics are not doctors, but we may similarly outline, organize and streamline the teaching program to meet the basic essentials of what a doctor must know to handle these problems and give that knowledge to him directly in the daily routine treatment of the sick. In this way we may produce the necessary number of men sufficiently qualified to handle this problem; men with minimum training, to be sure, but collectively able to produce maximum results in this current emergency.

PSYCHOSOMATIC PROBLEMS

JACK R. EWALT, M.D.

GALVESTON, TEXAS

In the best concept of the term, all human beings are psychosomatic problems. Every patient has both somatic and psychologic problems, excepting those that are dead when the doctor arrives. Draper¹ has stated "If we examine closely the structure of organismic unity which doctors nowadays seem to be striving so hard to preserve for the individual we may find perhaps that its division resides in a contemporary medical attitude and not within the animal at all." Patients in any service show varying degrees of emotional disturbance which alter the course of their illness, and these must be evaluated and treated if optimum conditions for recovery are desired.

Psychosomatic problems may be divided into (1) patients with symptoms referred to one of the body systems but without demonstrable evidence of somatic pathologic change and (2) patients with definite structural alterations thought to be at least in part due to psychologic disturbances.

The patients of the first type, that is, persons with somatic complaints but without observable organic lesions, may in turn be subdivided into two groups. The first of these subtypes is the so-called psychoneuroses, that is the ordinary hysterias, the obsessive ruminative states and the neurasthenias. These patients will usually have a long history of maladjustment, and their neurosis is on such a subtly conditioned basis that management by a skilled psychotherapist is necessary for satisfactory relief of symptoms.

The second subtype consists of the simple anxieties, in which the person responds normally to some immediate environmental situation but in such degree and for so long that changes in physiologic function occur and symptoms are produced.

In these patients reacting to immediate situations with anxiety, the extent and type of symptomatology will vary with the past history and the personality pattern of the individual who is subjected to the environmental stress. One thinks of the person of "coon dog temperament" as showing little response to situations that might cause his "fox terrier" brother untold misery in terms of cold sweats, diarrheas and lost sleep. It is probable, however, that every one has a threshold at which point objectified fears will express themselves as indefinite anxieties, pains and bodily complaints. Into this group fall many of the so-called war neuroses and many of the patients we see in the medical clinics and in the general hospital ward. These individuals, in situations of stress, show an exaggerated response in the autonomic sphere. Noting these sensations, they believe they are ill. Consultation with neighbors or review of the family's medical history often reveals persons suffering from heart disease, cancer or some other illness. The patient, fearing he is similarly afflicted, becomes increasingly concerned over his health; this adds to his burden of worry, increasing his symptoms and giving him more to worry about. We

From the Department of Neuropsychiatry, University of Texas School of Medicine.

Read in a panel discussion on "Neuropsychiatry" in the General Scientific Meetings at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 13, 1944.

1. Draper, G.: *The Concept of Organic Unity and Psychosomatic Medicine*, J. A. M. A. 124:767 (March 18) 1944.

also see "Dr. Built" anxiety of a similar sort. Persons applying for insurance or routine physical examinations may be informed they have "leakage of the heart," anemia or some other condition. The doctor gives such information in his attempt to impress the patient with his skill and thoroughness or to assure himself of an alibi in case the patient falls dead of a coronary attack ten to twenty years later. The patient, having it on good medical authority that he is ill, may begin to dwell on his bodily function to the exclusion of most other interests. In the military setting we see persons subjected to new ways of living, prolonged strain, discomfort or danger developing severe anxiety symptoms with complaints referable to the various body systems. Patients in this group can and should be treated in the general medical clinics. They make up a large, unhappy and misunderstood group of patients who shop from clinic to hospital to the quacks and return. The management of such cases has been discussed elsewhere.²

The second large group of psychosomatic problems comprises those patients with symptoms similar to the anxiety patients but with definite structural lesions in which the psychogenic factors are felt to play an important etiologic role. Studies have been made on peptic ulcer, hypertension, coronary disease, bronchial asthma, mucous colitis and the arthritic disturbances, to mention a few. In considering these disorders two quotations are apt. Nolan Lewis³ has stated "Those who neglect to take into account the psychological factors in disease should be reminded that psychological energy acts through physical structures and produces physical effects, as otherwise phenomena could not appear." And Dunbar⁴ ". . . at least much too often an etiological relationship between the psychic problem and the illness has been assumed rather than demonstrated."

Many of the studies have been devoted to extensive investigations of the emotional growth and the vicissitudes of the patients suffering from various types of organ dysfunction and pathologic change. Most workers have exercised a laudable caution in ascribing a definite cause and effect relationship to their findings, yet the occurrence of typical psychodynamic configurations in certain types of disorder has led to the suspicion that these influences play an important if not the principal role in the production of the ailment. If this is true, how can psychologic conflicts produce structural alterations in the tissues? From a physiologic point of view the means must be by alterations in autonomic and endocrine functions secondary to psychologic disturbances. Anatomically this means alterations in the cortical and hypothalamic regions, as these areas appear to be the principal central regulators of autonomic function. The second question is Can alterations in autonomic physiology produce pathologic lesions in any organ system? This question may be most logically answered by considering the results of experimental attempts to reproduce certain pathologic lesions by first organic and second psychologic alterations in autonomic functions.

First I will consider ulcerative lesions of the upper gastrointestinal tract. Organic lesions of the central nervous system may produce ulceration of the mucosa of the upper gastrointestinal tract. This has been reported

in human patients by Cushing.⁵ Numerous animal experiments have shown that hypothalamic stimuli or injury frequently produces hemorrhage and erosion of the gastric mucosa. Keller, Hare and D'Amour⁶ produced acute lesions of the gastrointestinal tract by producing intraventricular hemorrhage or by section of the brain at the level of the chiasm. They also produced gastric lesions by hypothalamic lesions in cats. Hoff and Sheehan⁷ produced multiple hemorrhagic erosions of the mucosa of the stomach by lesions involving the tuberal area in monkeys. Keller and D'Amour⁸ report similar findings in the dog and also show that the occurrence of hemorrhage into the mucosa was not prevented by section of the vagus fibers and that ulceration was not prevented if the sympathetic fibers were removed. Watts and Fulton⁹ found that gastric and duodenal ulcerations in monkeys were produced by extensive hypothalamic damage. They explained these lesions as being principally due to ischemia of the mucosa brought about by the vasoconstrictor fibers. These reports have several points in common. Mucosal lesions were very rarely found in the control animals in any series. In the experimental groups the lesions occurred in some of the animals but not in all, even though the central lesion was the same in all animals of a given series. None of the authors offer an explanation for this difference in response to the experimental lesion, although it seems obvious that some factor present in some animals and absent in others, plus the central lesion, was necessary to produce the ulceration.

We thus have abundant evidence in experiments from nature and from the laboratory that central lesions can and do produce structural alterations in the gastrointestinal mucosa of some human beings and some animals. Having established that experimental interference with hypothalamic function is productive of gastrointestinal lesions, we may next consider what role the hypothalamics play in emotional adjustment and the organ participation in our daily living.

The material on this phase of the subject is voluminous. Miller¹⁰ has summarized the literature, stating "It may be asserted that the hypothalamics regulate emotional as well as visceral and somatic manifestations, and all these are frequently concomitant. The conscious awareness that the individual is himself in the throes of emotion implies an activity on the part of the cortex." Miller, in commenting on the corticohypothalamic relationship, says that ". . . the cortex is to the subcortex as the fine adjustment on a microscope is to the coarse adjustment." Wittkower¹¹ has made a thorough survey of the literature and presents some original data on the influence of emotions on organ function, showing that physiologic processes of many sorts are altered by various emotional states. One of the most conclusive bits of evidence that emotional factors, by altering autonomic function, profoundly influence the development of gastrointestinal ulcerations

5. Cushing, H. Peptic Ulcers and the Interbrain, *Surg., Gynec & Obst.* 55:1, 1932.

6. Keller, A. D.; Hare, W. K., and D'Amour, Marie. Ulceration in the Digestive Tract Following Experimental Lesions in the Brain Stem, *Proc. Soc. Exper. Biol. & Med.* 30:772, 1933.

7. Hoff, E. C., and Sheehan, D. Experimental Gastric Erosions Following Hypothalamic Lesions in Monkeys, *Am. J. Path.* 11:789, 1935.

8. Keller, A. D., and D'Amour, Marie. Ulceration in the Digestive Tract of the Dog Following Hypophysectomy, *Arch. Path.* 21:185 (Feb.) 1936.

9. Watts, J. W., and Fulton, J. F. The Effect of Lesions of the Hypothalamus upon the Gastrointestinal Tract and Heart in Monkeys, *Ann. Surg.* 101:363, 1935.

10. Miller, H. R. Central Autonomic Regulations in Health and Disease, New York, Grune & Stratton, Inc., 1942.

11. Wittkower, E. Studies on the Influence of Emotions on the Functions of the Organs, *J. Ment. Sc.* 81:513, 1935.

2. Ewalt, J. R. *Psychosomatic Medicine*, Texas State J. Med. 40:5, 1944.

3. Lewis, N. D.: *A Short History of Psychiatric Achievement*, New York, W. W. Norton & Company, Inc. 1941.

4. Dunbar, L.: *Emotions and Bodily Changes*, ed. 2, New York, Columbia University Press, 1938.

is found in the studies of Wolf and Wolff.¹² In a patient with a gastric fistula they observed that emotions of anxiety and hostility produce hypermotility, hyperemia and small areas of hemorrhage in the gastric mucosa. They have demonstrated that these hemorrhagic areas ulcerate readily if exposed to gastric secretion. They have also shown that the small areas of hemorrhage, on exposure to acid secretions, produce more hyperemia and hypermotility. These observations are in keeping with observations that "many peptic ulcer patients show an exaggeratedly aggressive, ambitious and independent attitude. . . ." ¹³ Draper ¹⁴ has studied the incidence of peptic ulcer from several angles. Among many facts he has noted a predominance of aggressive trends, which were found most frequently in males. He also noted certain anthropologic peculiarities in ulcer patients which further emphasize the correlations between physique, psychologic experience and disease. The observations of Spicer and his co-workers ¹⁵ that perforation and hemorrhage from gastrointestinal ulceration increased significantly during the London blitz also suggests the role of emotional states in the cause and course of ulceration of the upper bowel.

Further experimentation similar to that of Wolf and Wolff are indicated. At present we can say that there is abundant evidence to show that autonomic dysfunction, whether organically or emotionally induced, can produce definite alterations in the function and structure of the gastrointestinal system. We have evidence that hostility and anxiety are the emotions productive of such changes and that such characteristics are the ones consistently found in human beings suffering from peptic ulcer as well as those with ulcer-like symptoms but no evidence of mucosal erosion. We also know that the relief of such emotional states favorably influences the course of peptic ulcer and relieves the ulcer-like symptoms of nonulcer patients. Thus the circumstantial evidence becomes rather convincing that ulcers are due to a specific type of emotional reaction in persons of certain constitutional and personality organization. To date we have not produced ulceration by experimentally induced emotional states, unless the German Air Force experiments ¹⁶ over London may be so interpreted.

Hypertension and heart disease are the greatest causes of disability and death in persons past 50 years of age. In our clinic these cases are next in frequency to those with gastrointestinal complaints. An abundant literature is accumulating on the subject, but nowhere do we find the complete answer to the cause or the treatment of this group of disorders. The fact that emotional states may produce profound temporary changes in pulse rate, fainting attacks, blushing and similar vascular phenomena has led to an investigation of the role of psychologic disturbance in the production of hypertensive cardiovascular disorders. Animal experiments have offered some interesting data. Fulton ¹⁷ has shown that faradic stimulation of areas 4 and 6 of the cortex of cats and monkeys will produce a sharp rise in systolic pressure. This effect is abolished by deep general anesthesia or by local anesthesia of the cortex and is reduced by splanchnic nerve section or by destruction of the stellate ganglion. There are many

reports on the role of the hypothalamus in controlling the level of the blood pressure and in the production of experimental hypertension. The reports vary considerably but in general indicate that stimulation of certain portions of the hypothalamus will produce an increase in blood pressure. Miller ¹⁸ has made an excellent survey of the literature on this subject. Allen ¹⁷ has observed interesting differences, in the blood pressure response, to clamping the pedicle of explanted kidneys in dogs. He explains the difference in blood pressure response as being at least in part due to the personality differences or temperament types of the dogs. Thus animal experiments show that the central nervous system by means of the autonomic and hormonal system may influence the blood pressure level. It must be borne in mind, however, that none of these experiments produce in the animal conditions simulating essential hypertension or the cardiovascular syndromes of man and that essential hypertension has been produced experimentally by the Goldblatt preparations. On the other hand, hypertension has been relieved to some extent by the surgical removal of portions of the sympathetic nervous system in man, yet the same operation in Goldblatt's animals produces no lowering of the blood pressure.¹⁸

Many studies have been made of the psychologic functions in patients with cardiovascular disease. Wittkower ¹⁹ reports changes in the electrocardiogram and heart size due to strong emotional stimuli and makes an extensive review of the literature on the subject. Merritt ²⁰ observed inversion of the T wave in the electrocardiogram of patients with "neurocirculatory asthenia." Weiss ²⁰ considers the etiology of essential hypertension to be an interaction of endocrine, autonomic and psychic factors in persons of a particular constitutional pattern. Psychiatrists have made many detailed studies of patients suffering from the cardiovascular diseases and find that they present a distinct behavior pattern. These behavior traits have been very well described by Dunbar,²¹ who has studied this phase of the problem extensively. Alexander ¹² states that "the hypertensive individual seems to be continuously balanced between an intense nearly conscious but inhibited rage and equally intensive passive dependent wishes." It has been reported ²¹ that treatment directed toward solving the patient's emotional problems in the early phases of hypertension produces a good therapeutic result in many cases. In the late phases of the disorder the amount of relief of the distressing symptoms that may be produced by psychotherapy is approximately as great as that produced by surgical and drug therapy. In the case of the cardiovascular syndromes the evidence that emotional factors play a role in the etiology of these states is suggestive but by no means as definite as in the ulcer cases. In no case have we been able to produce essential hypertension or heart disease in animals or man deliberately by chronic psychologic stimuli.

The other psychosomatic problems could be considered in a similar manner, but the ones discussed serve as illustrations. We thus have two groups of psychosomatic problems: (1) patients without organic

12. Wolf, S., and Wolff, H. G.: Evidence on the Genesis of Peptic Ulcer in Man, *J. A. M. A.* **120**: 670 (Oct. 31) 1942.

13. Alexander, F.: Ten Year Report 1932-1942 of the Institute for Psychoanalysis, Chicago, Institute for Psychoanalysis, 1943.

14. Draper, G., and Touraine, G. A.: The Man-Environment Unit and Peptic Ulcer, *Arch. Int. Med.* **49**: 616 (April) 1932.

15. Spicer, C. D.; Stenart, D. N., and Winsor, D. M.: Perforated Peptic Ulcer During the Period of Heavy Air Raids, *Lancet* **1**: 14, 1941.

16. Fulton, J. F.: *Physiology of the Nervous System*, ed. 2, New York, Oxford University Press, 1943.

17. Allen, F. M.: Acute Hypertension with Clamping or Ligature of Explanted Kidney, *J. Urol.* **46**: 834, 1941.

18. Goldblatt, H.; Kahn, J. R., and Lewis, H. A.: Studies in Experimental Hypertension, *J. A. M. A.* **119**: 1192 (Aug. 8) 1942.

19. Merritt, W.: Inversion of the T Waves of the Electrocardiogram in 2 Patients with Neurocirculatory Asthenia, *Ann. Int. Med.* **20**: 77, 1944.

20. Weiss, E.: Psychosomatic Aspects of Hypertension, *J. A. M. A.* **120**: 1081 (Dec. 5) 1942.

21. Dunbar, F.: *Psychosomatic Diagnosis*, New York, Paul S. Hoeber, Inc., 1943.

lesions with symptoms due to maladaptation to their environment and (2) patients with organic lesions which may be in part due to maladaptation to their environment. It is possible that the two groups represent different methods of reaction to conflict by constitutionally different persons and not two distinct types of disorder. Much careful experimentation and detailed observation remain to be done.

CONCLUSION

Psychosomatic problems may be divided into two large groups:

I. Patients who react to emotional and environmental stress with bodily complaints and alterations in physiology but without alterations in body structure. These cases are (a) the psychoneuroses and (b) states of simple anxiety.

II. Patients with structural and functional alterations of pathologic proportion in which the emotional reaction to environmental stress appears to play an important role. These problems are still in the experimental phase, but it becomes increasingly evident that emotional factors play some role in all the illnesses of man, and these forces must be evaluated in any study of the cause and treatment of human sickness.

THYROTOXICOSIS TREATED WITH THIOURACIL

WILLIAM S. REVENO, M.D.

DETROIT

Interference with the production of thyroid hormone in animals, first by sulfaguanidine and later by other chemicals, notably thiourea and thiouracil, has been demonstrated by the Mackenzies and McCollum,¹ Richter and Clisby,² Kennedy³ and Astwood and his co-workers.⁴ Observations of this effect in human beings and its application in the treatment of hyperthyroidism were first made by Astwood,⁵ who reported on the clinical use of both thiourea and thiouracil, and later by Williams and Bissell⁶ and by Himsworth,⁷ using thiouracil and thiourea respectively. All reported uniformly good results, but some adverse effects were noted also. Two thiouracil treated patients showed evidence of agranulocytosis,⁸ while 2 more showed pitting edema with some evidence of renal involvement.⁹ Both thiourea⁵ and thiouracil⁹ produced a skin rash in 5 patients. Mild jaundice was noted once.¹⁰

While the total reported number of treated patients has been small and the period of observation relatively

brief, there has been close agreement by all observers that disappearance of toxic symptoms occurs coincidentally with a fall in the basal metabolic rate and a gain in body weight after a latent period of one to several weeks. When the chemical is discontinued all toxic signs return quite promptly. Little or no change takes place in the size of the thyroid, but there may be some softening of the gland. Iodine has no influence on the action of these drugs, but thyroid extract is directly antagonistic.

Experience in the treatment of 9 ambulatory patients with thiouracil¹¹ over a period of eight months is herewith detailed. All had toxic adenomas and 5 had been taking Lugol's solution immediately preceding treatment. All except 2 are still under observation.

REPORT OF CASES

CASE 1.—C. C., a man aged 40, had been under treatment for diabetes mellitus and hyperthyroidism since 1936. Adenoma of the right lobe, with nervousness, tremor, palpitation, weight loss and elevated basal metabolic rate were all present. Diabetes was difficult to control until Lugol's solution was started, when it became stabilized on 20.0-20 units of crystalline insulin daily. Nervousness and weight loss stopped, but the tremor, palpitation, elevated blood pressure and increased pulse pressure continued. The basal metabolic rate in March 1940 was plus 35 per cent, in May 1940 plus 16 per cent, in October 1941 plus 18 per cent and in October 1942 plus 11 per cent.

Lugol's solution was continued until Aug. 7, 1943, when thiouracil 0.8 Gm. daily was started and continued at this level until April 1, 1944, except for two interruptions of eleven and sixteen days each. As may be noted in chart 1, the basal metabolic rate did not fall in the expected manner during this entire period of observation, nor did it rise during the two intervals when the drug was stopped. The body weight and blood cholesterol levels also failed to show appreciable change. Only the tremor and moist palms showed improvement, and the systolic and pulse pressure levels were lower. The diabetes remained under control, and the thyroid gland was unchanged.

All evidence points to a poor response to the drug, and the most that can be said for the effect of thiouracil here is that it performed as well as and no better than Lugol's solution. The prolonged administration of iodine may have been responsible for the poor response, since it has been shown that there is delay of thiouracil action with previous iodine administration.¹²

CASE 2.—L. B., a man aged 64, was first seen in January 1943 because of weakness and exhaustion. There were warm moist palms with tremor, and a nodular bilateral thyroid enlargement, partly substernal. The blood pressure was 120/60 and the weight 169 pounds (77 Kg.). The basal metabolic rate was plus 24 per cent. There was prompt improvement with Lugol's solution, and in four weeks the basal metabolic rate was plus 6 per cent. This treatment was continued until March 31, 1943 and then stopped. The patient was not seen until August 23, when he again complained of a return of his former symptoms. Thiouracil was started on August 24. Chart 2 illustrates the prompt lowering of the basal metabolic rate and the gain in body weight that followed in four weeks. A three weeks interruption in administration of the drug between December 15 and January 10 resulted in a rise of 22 per cent in the basal metabolic rate but an increase in the blood cholesterol level. The figures for this determination are apparently not in accord with the rest of the data and their significance must accordingly be discounted.

The patient continues at his daily work symptom free on 0.4 Gm. of thiouracil daily. The thyroid gland is somewhat larger but softer than it was in the beginning.

From the Departments of Medicine, Harper Hospital and Wayne University College of Medicine.

1. Mackenzie, J. B.; Mackenzie, C. G., and McCollum, E. V.: Effect of Sulfamylguanidine on the Thyroid of the Rat, *Science* **94**: 518-519 (Nov. 28) 1941. Mackenzie, C. G., and Mackenzie, J. B.: Effect of Sulfonamides and Thioureas on the Thyroid Gland and Basal Metabolism, *Endocrinology* **32**: 185-209 (Feb.) 1943.

2. Richter, C. P., and Clisby, K. H.: Graying of Hair Produced by Ingestion of Phenylthiocarbamide, *Proc. Soc. Exper. Biol. & Med.* **48**: 684-687 (Dec.) 1941; Toxic Effects of Bitter Tasting Phenylthiocarbamide, *Arch. Path.* **33**: 46-57 (Jan.) 1942.

3. Kennedy, T. H.: Thioureas as Goitrogenic Substances, *Nature, London* **150**: 223-234 (Aug. 22) 1942.

4. Astwood, E. B.; Sullivan, J.; Bissell, Adele, and Tyslowitz, R.: Action of Certain Thiouracil, *Endocrinology* **32**: 185-209 (Feb.) 1943.

5. Astwood, E. B.: Thiouracil, *Endocrinology* **32**: 185-209 (Feb.) 1943.

6. Williams, R.: Thiouracil, *Endocrinology* **32**: 185-209 (Feb.) 1943.

7. Himsworth, H. P.: Thyrotoxicosis Treated with Thiouracil, *Lancet* **2**: 465-466 (Oct. 16) 1943.

8. Gabrilove, J. L., and Kert, M. J.: Sensitivity to Thiouracil, *J. A. M. A.* **124**: 504-505 (Feb. 19) 1944. Astwood,⁵

9. Gabrilove, and Kert,⁸ Sloan and Shorr,¹⁰

10. Sloan, Margaret H., and Shorr, E.: Metabolic Effects of Thiouracil in Graves' Disease, *Science* **99**: 305-307 (April 14) 1944.

11. The thiouracil was supplied by Dr. B. W. Carey of the Lederle Laboratories, Inc., Pearl River, N. Y.

12. Rawson, R. W.; Evans, R. D.; Means, J. H.; Peacock, W. C.; Lerman, J., and Cotrell, R. E.: The Action of Thiouracil upon the Thyroid Gland in Graves' Disease, *J. Clin. Endocrinol.* **41**: 1 (Jan.) 1944.

CASE 3.—Mrs. R. W., aged 45, had enlargement of the thyroid gland for the past twenty years. She was seen irregularly during this time but presented no evidence of thyrotoxicosis until seven years before I saw her, when she showed a basal metabolic rate of plus 22 per cent. In April 1942 the rate was plus 12 per cent, and a circumscribed firm nodule

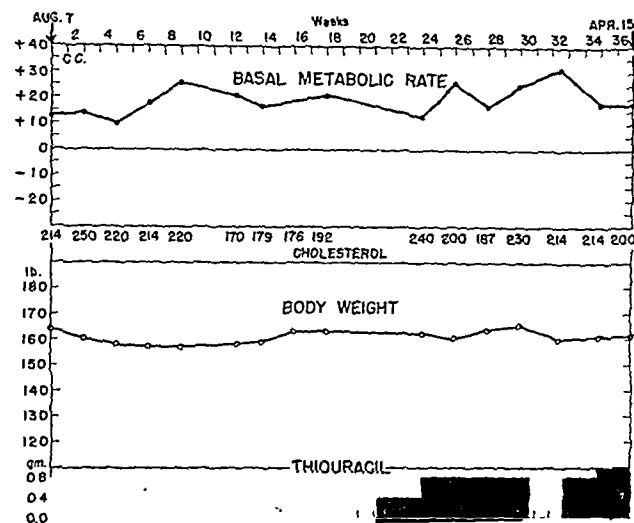


Chart 1.—Course with thiouracil in case 1.

was palpated in the right lobe of a uniformly enlarged cystic thyroid gland. Sept. 3, 1943 she first sought help for nervousness, palpitation and tremor, which had appeared three months before along with irregularity in menstruation. Again the thyroid gland showed a bilateral cystic enlargement with a firm nodule in the right lobe. The skin was flushed, there was a fine tremor of the hands and she was obviously restless and disturbed.

Thiouracil was started on September 11, the initial dosage being 0.8 Gm. per day. This was reduced to 0.6 Gm. daily after nineteen days because of epigastric discomfort and pain. As improvement set in and the basal metabolic rate dropped to minus 3 per cent (chart 3) the dosage was further reduced

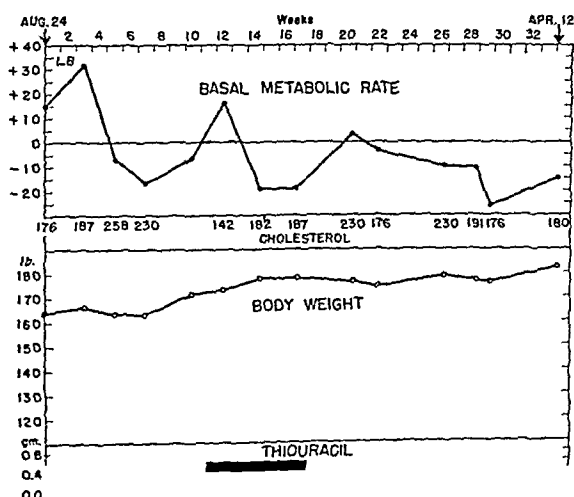


Chart 2.—Course with thiouracil in case 2.

to 0.4 Gm. daily; but, with a rise in the basal metabolic rate during the next four weeks, 0.6 Gm. was again given daily. She continued symptom free, with little change in the thyroid gland, until March 1, when she noticed an increase in the size of her goiter associated with a choking feeling. This change became more evident during the following four weeks, and the nervousness and tremor returned. No thiouracil was taken for nine days previous to reexamination on March 29.

At this time both lobes of the thyroid showed increase in size, the right more than the left, and there was compression of the trachea with displacement toward the left. Nervousness and palpitation had returned, and the basal metabolic rate was now plus 21 per cent.

Lugol's solution was given and thyroidectomy was performed by Dr. Clark D. Brooks on April 6, 1944. Recovery was uneventful. Examination of the specimen by Dr. Plimm F. Morse disclosed an irregular, lobulated mass of thyroid tissue weighing about 150 Gm., on the external surface of which were many pedunculated nodules hanging from the capsule in a grapelike manner. These nodules were of varying size, some reaching 2 cm. in diameter. On section, many areas of recent hemorrhage and brownish spots due to older hemorrhage were found throughout the structure of the gland. Microscopically the structure was that of a colloid adenoma with large, over-filled, thin walled follicles lined with very flat and compressed epithelium. There were no areas of hyperplasia. In addition to the old and new hemorrhages there were areas of necrosis with beginning organization. No malignant condition was present.

Failure to find hyperplasia, the expected change resulting from thiouracil administration, can be explained only by the fact that no thiouracil had been

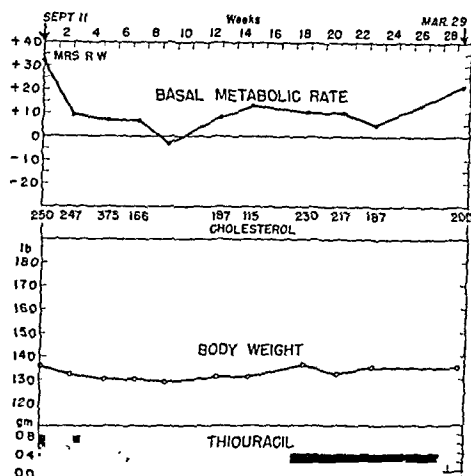


Chart 3.—Course with thiouracil in case 3.

taken for seventeen days previous to operation, while iodine had been given for six days preoperatively. The interval for the disappearance of thiouracil hyperplasia does seem short, but it may have been made so by the iodine. The latter effect deserves consideration in view of the established observation that iodine has no influence on the change induced by thiouracil.¹ Astwood² reports that a patient with a large nodular thyroid and a metabolic rate of plus 20 to plus 30 per cent failed to respond to thiouracil. Carcinoma of the thyroid was found, while the remainder of the gland was composed of colloid filled alveoli with uniformly flat epithelium. A certain degree of similarity to the findings just reported may be noted, but the parallelism ends abruptly since our patient showed no evidence of cancer and, for a time at least, responded to the treatment.

Of important significance is the finding of old and new hemorrhage and areas of necrosis in the gland; and while these may have occurred for other reasons, they may also have been caused by thiouracil.

CASE 4.—Miss E. R., aged 76, when first seen in August 1941 was suffering from nervousness, tremor, palpitation, weight loss and ankle edema. There was hypertension (190/99), a hard nodule in the left lobe of the thyroid, auricular fibrillation, tremor and warm moist palms. The basal metabolic rate was

plus 21 per cent. The nervousness and palpitation improved and she gained weight while taking Lugol's solution and digitalis, but she continued to fibrillate, had edema of the lower extremities, and the metabolic rate continued between plus 17 and 35 per cent.

Lugol's solution was stopped Sept. 3, 1943 and thiouracil 0.8 Gm. per day was started September 15. Digitalis was continued. In spite of a reduction in dosage to 0.6 Gm. per day after the first two weeks, improvement proceeded without interruption (chart 4). Digitalis was discontinued after eight weeks and the thiouracil reduced to 0.4 Gm. per day. All evidence of hyperthyroidism has disappeared and there has been no reactivation in spite of two attacks of acute upper respiratory infection. There is no fibrillation and no ankle edema. The thyroid gland is slightly larger but somewhat softer than at first.

This represents a highly satisfactory result obtained in a patient with severe thyrocardiac involvement.

CASE 5.—Mrs. B. C., aged 62, was seen in May 1943 because of dizziness, blurring of vision and exhaustion. There was tremor, moist warm palms, and a palpable adenoma in the right lobe of the thyroid. The basal metabolic rate was plus 38 per cent and the blood cholesterol 150 mg. per hundred cubic centimeters. Some improvement followed administration

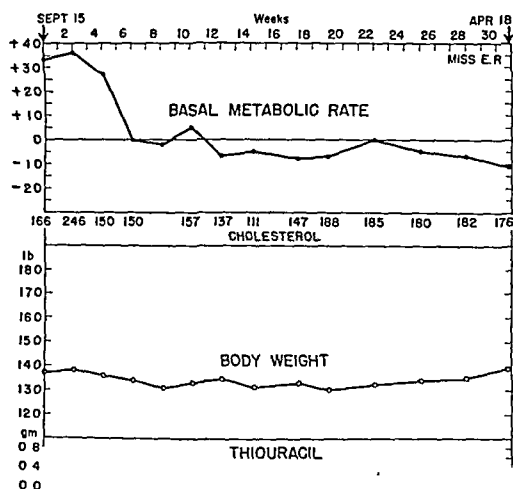


Chart 4.—Course with thiouracil in case 4.

of Lugol's solution for a period of four and one-half months. The tremor, exhaustion and elevated metabolic rate continued. The thyroid adenoma remained unchanged.

Thiouracil was started October 1. After ten days the patient developed nausea, chills and fever; the drug was stopped for two days and then reduced from 0.8 to 0.6 Gm. per day. This dose was continued for eight weeks, then increased to 0.8 Gm. per day. There was no ill effect, and a lowering of the basal metabolic rate together with a general improvement followed within two weeks and has continued since then (chart 5). The thyroid adenoma was unchanged except that it felt slightly softer.

CASE 6.—Mrs. G. P., aged 50, complained of being tired, short of breath, and unable to lie down for any length of time. There was an annoying persistent cough, a smothering sensation, palpitation and nervousness. This disturbance had been present for several months previous to January 1943, when she was first seen. Her weight was 191 pounds (87 Kg.), the blood pressure 150/90, the heart enlarged to the left with a systolic murmur at the apex and fibrillation with a pulse deficit of 28. Moist rales were noted at the lung bases, and there was edema of both lower extremities. There was an adenoma of the right thyroid lobe, and the basal metabolic rate was plus 24 per cent with a blood cholesterol level of 136 mg. per hundred cubic centimeters. She improved while taking Lugol's solution and digitalis and following a reduction

diet but tired of this regimen after three months and stopped all medication. In June her weight was down to 167 pounds (76 Kg.), all her previous symptoms had returned, and again there was a pulse deficit with the auricular fibrillation. Lugol's solution and digitalis were prescribed but not taken. She returned in November in much the same condition and this time was started on digitalis and 0.6 Gm. of thiouracil per day.

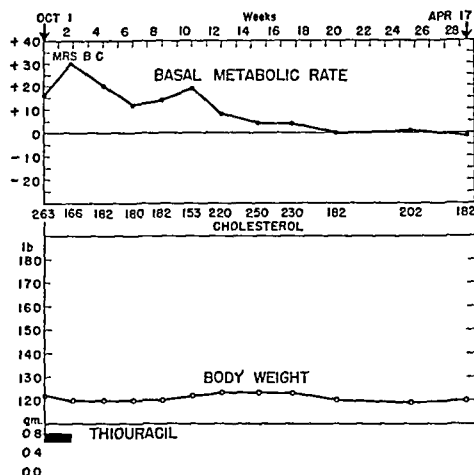


Chart 5.—Course with thiouracil in case 5.

The response was both prompt and satisfactory subjectively and objectively (chart 6). The pulse deficit had disappeared and the digitalis was discontinued five weeks after the beginning of treatment. From about the eighth week on however the patient showed evidence of failure to follow the treatment, and the subsequent observations are accordingly of little value.

CASE 7.—A. S., a man aged 67, appeared in November 1943 complaining of epigastric discomfort caused by reactivation of a duodenal ulcer. Attacks had occurred several times in the past two years. In addition to the evidence of duodenal ulcer, both lobes of the thyroid were palpable, with a small adenoma in the right lobe, and there was a tremor of the hands, with warm moist palms. The basal metabolic rate was plus 9 per cent. Thiouracil 0.6 Gm. per day was started November 22 and continued to the present except for two intervals, one

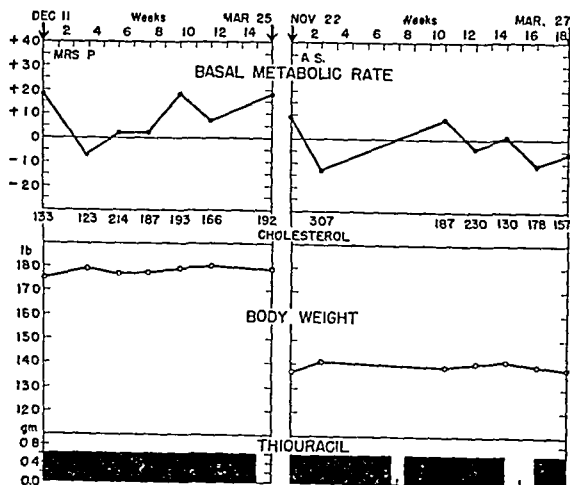


Chart 6.—Course with thiouracil in case 6.

of one week when he developed an acute upper respiratory infection and one of two weeks when he developed recurrence of severe epigastric pain.

While the response in this patient has been quite satisfactory the reactivation of ulcer symptoms while taking the thiouracil may have resulted either from

local irritation or from pituitary stimulation by the drug. Whichever is true, care certainly should be exercised in the administration of thiouracil to patients with peptic ulcer.

CASE 8.—Mrs. E. L., aged 82, complained of choking and tightening of the throat, dry cough, nervousness, insomnia and hypertension of long standing when she first appeared in January 1944. There was nodular enlargement of both lobes of the thyroid. The palms were warm and moist and there was a fine tremor. Lid lag and a definite "stare" were present. The pulse was rapid. The blood pressure was 220/120.

Thiouracil 0.6 Gm. daily was started January 24, before a basal metabolic rate determination was made. The only difficulty encountered in taking the drug was an initial gastric distress. Subjective improvement, such as decrease in cough and constriction of the throat, with lessening of tremor appeared within three weeks after starting treatment. By the time of the last visit, when the basal metabolic rate was minus 3 per cent, the pulse rate, nervousness, tremor and eye signs had subsided manifestly (chart 7).

CASE 9.—Mrs. S. A., aged 58, when seen Aug. 17, 1943, complained of weakness, palpitation, tremor and profuse perspiration of two years' duration. She had had a goiter since the age of 18. There was enlargement of the right thyroid lobe, the skin was moist and flushed and the blood pressure was 144/90. There was no tachycardia.

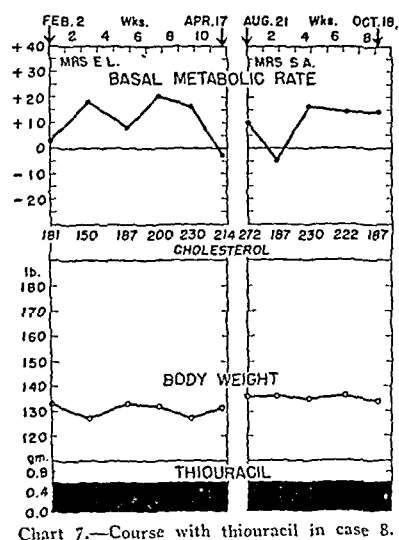


Chart 7.—Course with thiouracil in case 8.

The patient has not appeared for further observation, so that no conclusion can be drawn as to the effectiveness of the treatment.

COMMENT

In reviewing the treatment of these 9 patients the following points are worth noting:

1. *Dosage.*—The initial dose was either 0.6 or 0.8 Gm. daily. This was eventually reduced to 0.4 Gm. daily in cases 2 and 4; it was maintained at 0.6 Gm. daily in cases 3, 6, 7, 8 and 9 and was kept at 0.8 Gm. in cases 1 and 5. Tablets of 0.2 Gm. each were administered either two, three or four times daily.

2. *Reactions.*—Gastric distress in the form of pain, burning and gnawing was noted at the onset of treatment in cases 2, 3, 7, 8 and 9. This was promptly controlled by the taking of food along with the medication. Patient 6 reported nausea with chills and fever ten days after starting treatment. This lasted two days, during which the drug was stopped. No further reaction followed resumption of treatment. Opportunity for determining whether agranulocytosis had occurred was not available, since the patient was out of the city at the time of the reaction.

No instances of urticarial or toxic skin rash, agranulocytosis, anemia, edema or jaundice occurred.

The rapid enlargement of the thyroid in case 3, with increase in toxicity and evidence of recent and old hemorrhage in the gland, deserves mention as a possible effect of the drug.

3. *Elapsed Time Before Improvement.*—Excepting for case 1, in which no noteworthy effect resulted, the latent interval was two weeks in cases 6, 7 and 9, four weeks in case 2, six weeks in case 4, eight weeks in case 3, ten weeks in case 8 and fourteen weeks in case 5. The long interval in the last instance was undoubtedly due to too low a dosage of thiouracil.

4. *Changes in the Thyroid.*—No significant change was noted in the appearance of the gland except a slight softening in every case except in case 3, in which rapid enlargement developed.

5. *Blood Cholesterol Levels.*—No reliance could be placed on the results of these determinations, since the figures failed to rise or fall with decrease or increase, respectively, in basal metabolic rate determinations. Perhaps this is due to the fact that all patients in this series had toxic adenomas, a condition in which the inverse relationship between cholesterol level and basal metabolic rate is not as distinct as it is in toxic diffuse goiter.

6. *Previous Medication with Iodine.*—Five patients had been treated with iodine before thiouracil was given. With the exception of patient 1, all responded favorably to the treatment. It is possible that patient 1 failed to respond because of prolonged administration of iodine (six years).

CONCLUSIONS

Of 9 patients treated with thiouracil, 6 showed satisfactory results characterized by cessation of disturbing symptoms, fall in basal metabolic rate and gain in weight. Two of these patients had auricular fibrillation; in 1 of these the use of digitalis was discontinued after eight weeks; the other showed promise of improvement, which failed to materialize because of lack of cooperation.

One patient in whom diabetes mellitus coexisted, and who had been taking iodine for six years, failed to respond to therapy.

Another patient responded favorably at first but developed rapid enlargement of and hemorrhage into the gland and was subjected to surgery.

The third failure was of a patient who, while showing some clinical improvement, failed to show a drop in basal metabolic rate during the short period she was under observation.

The results in the responsive patients appeared as good as those following successful thyroidectomy.

968 Fisher Building.

Most Eminent Authority on Surgery During the Middle Ages.—Guy de Chauliac (1300-1368) was the most eminent authority on surgery during the Middle Ages. His *Chirurgia magna* was written in 1363. Born in the countryside near Auvergne in France, he took holy orders and was educated in medicine at Toulouse, Montpellier and Paris, with a special course in anatomy at Bologna. He settled in Avignon and was surgeon to the French popes. He operated for hernia and cataract but hesitated to cut for the stone. He employed the cautery for cancer. He treated ulcers by investing them with a collar of steel. His discussion of fractures and dislocations is good. He used Theodoric's narcotic or soporific inhalant as an anesthetic. He did not believe in the power of nature in healing wounds, but in the surgeon's intervention with salves, plasters, etc.—Clendening, Logan: *Source Book of Medical History*, New York, Paul B. Hoeber, Inc., 1942.

THE TREATMENT OF SULFONAMIDE
RESISTANT GONORRHEA WITH
PENICILLIN SODIUM

RESULTS IN 1,686 CASES

LIEUTENANT COLONEL THOMAS H. STERNBERG
AND

COLONEL THOMAS B. TURNER

MEDICAL CORPS, ARMY OF THE UNITED STATES

In May 1943, soon after preliminary evidence of the effectiveness of penicillin in the treatment of gonorrhea was obtained by Mahoney and his co-workers¹ and Herrell, Cook and Thompson,² studies were inaugurated by the Surgeon General's Office of the U. S. Army with a view to determining as rapidly as possible time-dosage factors in the penicillin treatment of this disease. The clinical trials were carried out in fifteen selected army hospitals. Altogether, 1,686 patients with sulfonamide resistant gonorrhea were studied.

METHOD OF STUDY

The hospitals participating in the study and the responsible investigators in each are shown in table 1. Similar requirements as to the selection of patients, methods of treatment and criteria of cure obtained in each.

Selection of Patients.—Patients admitted to the study were limited to those fulfilling the following conditions:

1. A clear history of gonorrhea acquired within the past few weeks or months.
2. Typical clinical signs and symptoms of gonorrhea at the time penicillin treatment was begun.
3. Smear and culture positive for gonococci immediately prior to penicillin therapy.
4. Sulfonamide resistant gonorrhea as determined by failure to respond to two or more courses of sulfathiazole or sulfadiazine, each course consisting of at least 20 Gm. of drug administered within a period of five days.

Plan of Treatment.—No patient was started on penicillin treatment until at least five days after the discontinuance of other medications, including sulfonamides. Solutions of penicillin in sterile saline solution or distilled water were prepared daily from the dried powder and were refrigerated at approximately 4 C. when not in use. The individual dose in all cases was either 10,000 or 20,000 Oxford units injected intramuscularly at intervals of three hours, day and night.

As originally projected this study called for the treatment of four groups of patients employing respectively a total dosage of 40,000, 80,000, 120,000 and 160,000 Oxford units, with each group further divided according to whether the individual dose was 10,000 or 20,000 units. The interval of three hours between doses remained constant for all groups.

Later, when it was apparent that favorable results were being obtained with all dosage schedules, two new groups were added, one employing a total dosage of 50,000 units and another employing 100,000. The latter

dosage levels were selected largely because of convenience, arising from the fact that the drug was commonly delivered in ampules containing 100,000 units.

It should be emphasized that no other medication and no local treatment whatever were given concurrently with penicillin or during the observation period.

Criteria of Cure.—Patients included in this study were routinely retained in the hospital for at least twenty-one days following the completion of penicillin therapy. During this period the following examinations were performed:

1. Daily examination for evidence of urethral discharge.
2. Daily two glass urine examination.
3. Cultures and smears for gonococci within forty-eight hours after the completion of treatment, and on the seventh, fourteenth and twenty-first days. These bacteriologic studies were made on material obtained from the urethra as long as such material was available. If no urethral discharge was present, cultures and smears were made on prostatic secretion expressed through prostatic massage. The prostatic secretion was examined either directly or after collection in urinary sediment.

TABLE 1.—Hospitals and Investigators Participating in
Clinical Trials

Hospital	Investigators
Camp Howze.....	Major G. A. Campbell, Capt. S. Bar
Barnes.....	Capt. L. A. Gehrs, Capt. M. Giffords
Brooke.....	Col. J. C. Woodland, Capt. F. Geiger
Fort Dix.....	Major S. L. Rumes, Capt. G. S. Barrett
Percy Jones.....	Capt. L. W. Holladay, Capt. A. W. Frisch
Fitzsimons.....	Lieut. Col. R. L. Smith, Major D. P. Greenlee
Fort Bragg.....	Major G. A. Campbell, Capt. M. Bolus
Lawson.....	Lieut. Col. E. C. Lowry, Capt. L. W. Hewitt
Army and Navy.....	Lieut. Col. I. S. Wright, Major A. W. Pinkerton
Billings.....	Major E. H. Burford
Oliver.....	Major S. T. Flynn, Major J. M. Flood
O'Reilly.....	Lieut. Col. A. I. Josey, Capt. F. E. Kirshman
Walter Reed.....	Capt. R. J. Murphy
Lovell.....	Major V. S. Diek, Capt. R. A. Snyder
Fort Benning.....	Major C. G. Stillinger, Major R. F. Kelsey

Patients were termed "cured" and released from the hospital if they were asymptomatic and bacteriologically negative on the twenty-first day after completion of treatment. As indicated later, the vast majority of patients became clinically and bacteriologically negative within the first week. "Failure" was determined by the presence of positive smears or cultures on the seventh post-treatment day or at any time thereafter, even though the patient had no urethral discharge. Because of the wide geographic dispersal of patients on release from the hospital, no attempt was made to obtain follow-up examinations beyond the period of hospitalization.

MATERIAL STUDIED

A total of 1,686 patients with sulfonamide resistant gonorrhea were included in the study. All were men between the ages of 18 and 38 years, the mean age being 23. The average duration of infection was fifty-one days. The average amount of sulfonamide drug received prior to penicillin therapy was 58 Gm. Most of the patients included in the study had received some form of local treatment subsequent to sulfonamide therapy. In addition, 236 patients had been treated unsuccessfully with hyperpyrexia, induced either mechanically or by means of typhoid vaccine.

From the Venereal Disease Control Division, Preventive Medicine Service, Office of the Surgeon General, U. S. Army.

Read before the Section on Practice of Medicine at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Mahoney, J. F.; Ferguson, C.; Buchholtz, M., and Van Slyke, C. J.: The Use of Penicillin Sodium in the Treatment of Sulfonamide Resistant Gonorrhea in Men, *Am. J. Syph., Gonorr. & Ven. Dis.* 27: 525, 1943.

2. Herrell, W. E.; Cook, E. N., and Thompson, L.: Use of Penicillin in Sulfonamide Resistant Gonorrheal Infections, *J. A. M. A.* 122: 289 (May 29) 1943.

RESULT OF TREATMENT

Results According to Total Dose.—In table 2 are shown the results of treatment with one course of penicillin, according to the total dose administered. It is evident that remarkably satisfactory results were obtained with all dosage schedules employed. In the first series of patients treated no important differences

TABLE 2.—Results of Treatment According to Dose of Penicillin (One Course Only)

Total Dose Penicillin	Number Treated	Failures	Per Cent Cured
160,000.....	144	3	97.9
120,000.....	191	9	95.3
80,000.....	225	10	95.6
40,000.....	137	12	91.2
100,000.....	433	15	96.5
50,000.....	556	77	86.2
Total.....	1,686	126	92.5

in the final result were noted among the groups treated with 40,000, 80,000, 120,000 and 160,000 units respectively.

When larger series were compared employing a total dose of 100,000 units for the one and 50,000 for the other, the results were significantly poorer with the smaller dose.

It should be pointed out that the dosage schedules used are only approximate, since at the time of these studies potency assays were crude and subject to as much as 25 per cent error in either direction in some instances. Furthermore, batches of the drug were shipped to the various hospitals all over the country and it is believed that in some instances, at least, conditions of shipment such as exposure to excessive heat may have resulted in a loss of potency. It was definitely noted that in certain hospitals using particular lots of penicillin the results were inferior to those of groups treated with the same dosage schedule elsewhere. This was particularly noticeable in the 50,000 unit group, since here the dosage was probably on the borderline of effectiveness and any loss of potency became evident by an appreciable increase in the percentage of failures. In two hospitals certain lots of the drug resulted in a 50 per cent failure rate at the 50,000 unit schedule of treatment. In the same hospitals using the same dosage schedule but with penicillin of different manufacture, the results were similar to those obtained elsewhere. On the other hand, the 91 per cent cure rate obtained in the 137 cases treated with 40,000 units of penicillin may have been due to the use of underassayed drug.

Effect of Size of Individual Dose.—No significant differences in the final results were noted when a given total dose was administered in individual injections of 10,000 or 20,000 units. For example, employing a total dose of 100,000 units, of 261 patients treated with five injections of 20,000 units each, favorable results were obtained in 96.6 per cent, while of 172 patients treated with 10 doses of 10,000 each, exactly the same percentage responded favorably (table 3).

These observations are of very practical importance from a military and probably a civilian standpoint. When the total amount of drug is administered in five doses at three hour intervals treatment is accomplished within a total period of twelve hours, while with ten

doses at the same interval treatment must extend without interruption through the night. In situations in which hospitals are understaffed or blackout precautions must be observed, it is advantageous to complete treatment during the daylight hours and largely during the normal working day.

Response to Treatment in General.—The response to treatment was ordinarily dramatic, with prompt disappearance of symptoms and reversal of cultures and smears to negative. The average time for the urethral discharge to disappear or change from purulent to mucoid was two days, although in the majority of cases both objective and subjective improvement was noted within a few hours after the beginning of treatment.

In patients responding to treatment, cultures were almost invariably negative within forty-eight hours, although smears taken within this period occasionally showed degenerated coccoid organisms. Smears of this type were rarely noted after forty-eight hours.

In roughly 20 per cent of the patients a slight intermittent mucoid discharge persisted from one to three weeks, gradually resolving over this period. At first it was thought that this indicated failure of therapy; however, since careful study commonly failed to reveal the presence of gonococci and this slight discharge eventually ceased spontaneously, it is now regarded as a normal finding incidental to the healing process.

Analysis of Failures.—Of the 1,686 patients treated, 126 failed to respond to one course of penicillin. Of these failures 84 became manifest by the end of the first treatment week, 31 during the second and 11 during the third. For the most part the 84 failures during the first post-treatment week were those patients receiving the lower total dosages of penicillin. In these cases the clinical response was not conspicuous. Moreover, while twenty-four to forty-eight hour cultures were usually negative, possibly because of the presence of excreted penicillin, the smears frequently remained positive and cultures became positive within a few days

TABLE 3.—Results of Treatment (Effects of Size of Individual Dose and Length of Treatment)

Total Dose	Size of Individual Dose	Length of Treatment, Hours	Number Treated	Number of Failures	Per Cent Cured
120,000.....	20,000	15	105	3	97.1
100,000.....	20,000	12	261	9	96.6
80,000.....	20,000	9	121	8	93.6
Total.....			486	20	95.9
120,000.....	10,000	23	86	6	93.0
100,000.....	10,000	27	172	6	96.5
80,000.....	10,000	21	101	2	98.0
Total.....			359	14	96.1

thereafter. The majority of the 31 failures which became manifest during the second post-treatment week responded temporarily to treatment and then relapsed both clinically and bacteriologically. Of the 11 failures appearing in the third post-treatment week, 6 were completely asymptomatic and were judged failures on the basis of bacteriologic evidence. Since these 6 patients were promptly and successfully retreated with penicillin, it is not known whether spontaneous bacteriologic cure would have resulted without the second course of penicillin.

Influence of Duration of Infection.—In 1,154 patients of this series the onset of gonorrhea was less than sixty days prior to the initiation of penicillin therapy, and in 532 infection had been present for longer than sixty days. A successful outcome was observed in 92 per cent of the one group and in 93 per cent of the other, indicating that duration of infection is not an influential factor in determining the response to penicillin therapy.

Influence of Previous Fever Therapy.—In addition to at least two courses of sulfonamides, 236 patients had been subjected to artificially induced hyperpyrexia for sulfonamide resistant gonorrhea. Of these 92.2 per cent responded to one course of penicillin, as compared with a response rate of 92.7 per cent for those who had not had previous fever therapy.

Influence of Race.—Of 139 Negro patients in the entire series of 1,686, 125, or 90 per cent, responded favorably to one course of penicillin, as compared with a favorable response of 92.8 per cent in the white group. This small difference in the results in the two groups is not considered significant.

Response of Patients with Complications.—In general it can be said that the complications of gonorrhea responded well to treatment with penicillin. In most instances improvement began shortly after the penicillin was administered and continued until the patient was well. Of 47 patients with acute epididymitis at the time penicillin therapy was initiated, 43 responded to one course and 4 required a second course. Of 14 patients with severe acute prostatitis 13 responded immediately, while the additional case responded to a second course of penicillin.

Included in this series of patients were 9 who had mild to moderately severe articular involvement associated with a persistent gonococcic urethritis. Presumably the joint lesions were gonococcic in origin. Of these 9 cases 3 responded to one course of penicillin and 2 to an additional course. In 4 cases there was no substantial improvement to two courses of penicillin, although the coexisting urethritis responded satisfactorily.

Not included in this series are 5 patients with sulfonamide resistant gonorrhea and severe acute arthritis, presumably gonococcic in origin, who, because of the severity of the disease, were given considerably larger doses of penicillin. The results were excellent in each case. Among the complications of gonorrhea observed was 1 case of gonococcic conjunctivitis, proved by culture, which responded to 160,000 units, and a case of keratoderma blennorrhagicum, which responded to 120,000 units.

Retreatment of Failures.—Of the total of 126 failures to one course of penicillin 85 were retreated, a total dose of 100,000 units being used in each. Of these, 78, or 91.8 per cent, were cured. In 4 of the 7 cases which failed to respond, a third course of 100,000 units of penicillin was given, with a satisfactory outcome in all. No true instance of penicillin resistance was observed.

Reactions to Treatment.—No serious reaction to penicillin treatment was observed. In 98 patients soreness at the site of injection was noted, but 42 of these patients were in a group of 50 who were treated with one lot of the drug. Other reactions listed were mild fever in 7, slight nausea in 5, headache in 4, chilliness in 4 and dizziness in 3. However, since the conditions

of the study required that all untoward signs or symptoms occurring during or immediately after penicillin treatment be recorded, it is probable that in many instances the symptoms noted were coincidental and not true reactions to the drug.

COMMENT

It is evident from the foregoing results that penicillin is remarkably effective in the treatment of gonorrhea. Doses totaling more than 80,000 to 100,000 units appear to offer little advantage over these amounts, and, indeed, the results obtained with 40,000 and 50,000 units are sufficiently good to warrant the use of these total doses when supplies of the drug are limited.

It is quite possible that somewhat better results might be obtained by varying the time-dosage relationship. Perhaps a two hour interval between doses would be more effective than the three hour interval employed in these studies. Likewise, larger initial doses followed by smaller doses might offer advantages over the schemes described here, but these variations appear to be questions of detail rather than ones of major importance.

In this series of cases, penicillin was administered by the intramuscular route, which on the basis of studies by Rammelkamp and Keefer³ appears to be superior for this purpose to intravenous administration. The practical advantages of intramuscular over intravenous administration are obvious. In order further to simplify the mechanics of treatment a practicable method of prolonging absorption and excretion of penicillin is needed. In this connection experiments are now in progress employing penicillin incorporated in oil vehicles in the hope that satisfactory results may be obtained by the administration of one or two large doses of penicillin.

While at the very onset of these studies it was evident that penicillin was greatly superior to the sulfonamides in the treatment of gonorrhea, it was nevertheless expected that a proportion of cases treated would prove to be resistant. This expectation of penicillin resistance failed to materialize, since all patients in this series subjected to three courses of treatment responded favorably. Furthermore, of the many thousands of soldiers treated for gonorrhea with penicillin during the past six months, instances of penicillin resistance have been extremely rare. The recent report of Cohn and Seijo⁴ tends to confirm this observation, since in their *in vitro* experiments penicillin concentrations of 1 to 10,000 killed all gonococcus strains tested.

The ability of the gonococcus to develop resistance to penicillin through initial exposure to small concentrations of the drug is still undetermined. The evidence afforded by this series indicates that this happens rarely, if at all, since 92 per cent of failures to the first course of treatment responded to a second course. Furthermore, of the 77 cases which failed following initial therapy with the small first course of 50,000 units of penicillin, 57 were retreated with a 100,000 unit schedule, of which 52, or 91.2 per cent, responded favorably. Of the 5 failures to the second course, 3 were given a third course of similar dosage, with satisfactory results in all.

The possibility of penicillin treatment of gonorrhea masking or delaying the appearance of manifestations

3. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, *J. Clin. Investigation* 22: 425, 1943.
4. Cohn, A., and Seijo, I. H.: The *In Vitro* Effect of Penicillin on Sulfonamide Resistant and Sulfonamide Susceptible Strains of Gonococci, *J. A. M. A.* 124: 1125 (April 15) 1944.

of early syphilis must be borne in mind. While most of the patients in this series were beyond the incubation period of primary syphilis, several cases were observed in which it is possible that penicillin affected the development of early syphilis. The most definite instance was that of a patient with a small ulcer at the frenum, to whom 100,000 units of penicillin was administered before the lesion was studied by dark field examination. The dark field examination was negative the day following and the lesion healed rapidly. Six weeks later a typical dark field positive chancre appeared in the same location. The patient denied further sexual exposure. Because of the known effect of penicillin on *Treponema pallidum*, patients receiving penicillin therapy for gonorrhea should be observed clinically and serologically for evidence of syphilis for a period of at least three months.

SUMMARY AND CONCLUSIONS

Studies have been carried out in fifteen selected army hospitals with a view toward determining as rapidly as possible time-dosage factors in the treatment of sulfonamide resistant gonorrhea with penicillin. A total of 1,686 patients refractory to at least two courses of a sulfonamide and in some cases to artificially induced fever were treated with total dosages varying from 40,000 to 160,000 Oxford units per case, the individual dose being 10,000 or 20,000 units intramuscularly every three hours.

These studies showed penicillin to be a remarkably effective drug in the treatment of gonorrhea, usually causing disappearance of symptoms and reversal of bacteriologic findings within forty-eight hours. One course of treatment with a dosage of 160,000 units per case effected cures in 98 per cent, 80,000 to 120,000 units in 96 per cent and 50,000 units in 86 per cent. No significant differences in the final results were noted when a given total dose was administered in individual injections of either 10,000 or 20,000 units. Furthermore, little advantage was gained by prolonging the time of treatment schedules beyond twelve hours.

Factors such as duration of infection, previous fever therapy and race appeared to have no effect on the results of therapy.

Of the total of 126 failures to one course of penicillin, 85 were retreated, using a 100,000 unit dosage. Of these, 78, or 91.8 per cent, were cured. Thus, by retreatment of failures with a second course, 99 per cent cures were obtained. No case in the entire series proved to be penicillin resistant.

Complications of gonorrhea responded well to penicillin, although the more serious forms of complications required prolonged treatment with higher dosage.

Reactions to penicillin were inconsequential, and in no instance was it necessary to discontinue treatment for this reason.

Because of the known effects of penicillin on *Treponema pallidum*, the possibility of masking or delaying the development of early syphilis must be considered.

Finally, it should be recognized that the treatment of gonorrhea has been completely revolutionized in the past few years, first by the introduction of the sulfonamides and, more recently, by the development of penicillin. It is clear that the management of gonorrhea now belongs within the sphere of the chemotherapist, and that local treatment is rarely necessary and may do more harm than good.

ABSTRACT OF DISCUSSION

LIEUTENANT COLONEL IRVING S. WRIGHT, M. C., A. U. S. This compilation of important data represents an encouraging example of cooperation in clinical research. This should encourage others to embark on similar studies when maximum data are needed in the shortest space of time. A few comments based on experiences at the Army and Navy General Hospitals and at many hospitals later visited may prove of interest. In some patients, both male and female, the cultures became negative within four to six hours after the initial dose. Certain of these patients had had profuse discharges, with positive cultures for six months or more. The possibility that the excretion of penicillin in the discharge is a factor in inhibiting the culture growth must be considered. Two patients, both men, had had profuse discharges for months. Smears from each were positive in the usual sense of interpretation; that is, many gram-negative intracellular diplococci, which could not be differentiated from gonococci, were found. Cultures failed to grow the organism. One of these patients had twenty-seven negative cultures in a laboratory that grew practically 100 per cent positive cultures in the remainder of the gonorrhea patients. These 2 patients were treated with five and eight courses of sulfonamides respectively, with hyperthermia and with two courses of penicillin of 100,000 units each. This therapy had absolutely no effect on the discharge or on the organisms seen in the smears. The findings suggest that the organism may not be a true gonococcus, but that is as far as we are able to go. I should like to ask Colonel Turner whether he knows of other examples of this group. We have tried penicillin in the treatment of rheumatoid arthritis which arose during the acute phase of gonorrhea and continued after the discharge had ceased. The etiologic classification of these cases is difficult. They differ from the so-called acute gonorrheal arthritis reported in the paper under discussion. The treatment of patients with typical rheumatoid arthritis has been disappointing in our hands. The broader implications arising from the findings of this and similar studies cannot be overestimated. Once more the scientific approach is leading the way, but the problems of its application must be carefully considered. This is easy for members of the armed forces and relatively easy for the professional prostitute. Today, however, our great source of infection is from the amateur pick-up, the girl who comes from a surprising cross section of our population. The widespread use of penicillin in this group must be the result of careful but intense educational programs. A note of caution must be raised, however, against the widespread increase of promiscuity which may arise, with its resultant serious dislocations to our social structure.

DR. JOHN F. MAHONEY, U. S. P. H. S.: It would be an error not to call attention again to the point that the use of penicillin in the treatment of gonorrhea may have the effect of masking or greatly altering the symptoms of the invasion of a concomitantly acquired syphilis. As the product becomes more generally available and more generally used, an increasing number of instances of faulty and delayed recognition of the latter disease probably will be encountered. Repeated serologic tests for syphilis for at least two months following treatment appear to offer the best safeguard, and this feature may well become an important part of follow-up work. In much of the early work with penicillin, investigators have been faced with the necessity of working with limited amounts of the product. This has called forth efforts to refine the dosage to a point where the utmost in results would be produced by each unit available. In the future, and especially if the material becomes as plentiful as now appears certain, the concept that "the dangerous dose is the small dose" will probably gain adherents. The objective will then be to use a sufficient amount of the drug to produce a clinical response as rapidly as possible. In view of the nontoxic character of the substance, the utilization of larger amounts may be accomplished without an appreciable risk of producing untoward symptoms. The questions of total dosage, the duration of treatment, the interval between injections and the number of injections cannot be considered as established at the present even in the light of the favorable results which have been recorded in the present report. Products of greater potency and the development of preparations which are absorbed and excreted less rapidly may have the effect of permitting the use

ment schedules to be utilized which are less burdensome and as effective as those in use at the present. The impact of the therapy on incidence of gonorrhea and especially on the public health approach to the disease forms an interesting field of speculation. Should the experiences of the future confirm the impressions which are inescapable on the basis of the material at hand, then surely control of the disease through the medium of the venereal disease clinic will require reorientation. A different type of facility may be needed to implement the new therapy. That gonorrhea may cease to be of major public health importance in the none too distant future seems to be an entirely reasonable assumption.

LIEUTENANT COLONEL THOMAS H. STERNBERG, M. C., A. U. S.: The existence or development of penicillin resistant cases of gonorrhea has been a possibility of great interest and of some concern to the Army. In the data presented by Colonel Turner it is of interest that no true instance of penicillin resistant gonorrhea was encountered, provided three courses of penicillin were administered. Since the termination of these studies, many thousands of individuals with gonorrhea have been treated with penicillin in various army hospitals, and particular efforts have been made to uncover cases not responding to adequate penicillin therapy. While such cases are not infrequently reported, investigation reveals that usually they have been labeled as penicillin resistant on the basis of either inadequate penicillin treatment or persistence of a mucoid discharge, which is bacteriologically negative and later proves to be nongonococcal in origin. I have just completed an extensive trip throughout the southwestern portion of the country, visiting numerous army hospitals routinely using penicillin in the treatment of gonorrhea. During these visits the relatively few instances of so-called penicillin resistant gonorrhea were investigated. In most instances the total dosage of penicillin did not exceed 200,000 units, and in no case was it possible to isolate a strain of gonococcus which was resistant in vitro to the more concentrated dilutions of penicillin. To date the army experience indicates that the incidence of truly penicillin resistant gonorrhea is at least unusual and further suggests that the term penicillin resistant gonorrhea should be applied cautiously and only after failure to respond to comparatively large doses of penicillin as determined by adequate clinical and laboratory studies.

DR. ALFRED COHN, New York: May I report the essential findings of a study on penicillin therapy in 100 women and 20 men who suffered from sulfonamide resistant gonococcal infections. This study is still in progress in collaborations with my associates Dr. Boris A. Kornblith and Dr. Isaak Grunstein. The 100 women were hospitalized for penicillin treatment at the gynecologic service of Dr. Howard C. Taylor Jr. at Bellevue Hospital. Our studies were directed first toward evaluating the optimal total dosage and second to determine an adequate time schedule for cure. The results of administering various amounts of penicillin in the female group point to the fact that a minimum total dosage of 100,000 Oxford units intramuscularly is both necessary and sufficient for bacteriologic cure. The time schedule that was found to be most satisfactory without failure averaged between six and nine hours. The penicillin was administered either in four intramuscular injections of 25,000 units each or by an initial injection of 50,000 units followed by two injections of 25,000 units each. Twenty ambulatory men who suffered for a number of months from sulfonamide resistant gonococcal infections with chronic complications, 18 with prostatitis and 2 with epididymitis, were treated at the Central Clinic of the Department of Health, City of New York. A total dosage of 100,000 Oxford units of penicillin was administered intramuscularly to all 20 patients. Two schedules of therapy were employed: 1. An initial injection of 50,000 units was followed by two subsequent injections of 25,000 units each at three hour intervals; total time of therapy, six hours. 2. An initial injection of 40,000 units was followed by two subsequent injections of 30,000 units each at two hour intervals; total time of therapy, four hours. Thus far no failure of therapy has been encountered in any of these 20 patients who have been followed up by repeated urethral and prostatic smears and cultures over a period of between two and four weeks. Urethral cultures taken at one hour intervals

after the initial injection of penicillin became negative between the third and fourth hour after treatment was initiated. Smears of urethral discharges showed involution and disintegration of the gonococci and leukocytes by the end of five hours in most cases. Our findings indicate that an adequate minimal dosage of 100,000 units of penicillin administered over a period of from four to six hours to ambulatory patients is a satisfactory routine in the treatment of sulfonamide resistant gonococcal infection.

COLONEL THOMAS B. TURNER, M. C., A. U. S.: In reply to Colonel Wright's question about observing the organisms which do not grow out on culture, we have observed a similar thing in our hospitals. We assume that it is due to the presence of penicillin and that they do not grow out.

PENICILLIN FOR THE TREATMENT OF CHEMORESISTANT GONORRHEA IN THE FEMALE

ROBERT B. GREENBLATT, M.D.

Surgeon (R) U. S. Public Health Service

AND

ANITA R. STREET

Laboratory Director, Southeastern Medical Center, Oatland Island

SAVANNAH, GA.

With the advent of the sulfonamides the eradication of gonorrhea from the human race seemed quite likely. The promise contained in the earlier reports for the treatment of gonorrhea with sulfonamides, however, has not been completely fulfilled. Moreover, the therapeutic results for the female have not been so good as for the male, because of vagaries in her anatomic makeup. The physiologic mucoid alkaline secretions of the cervix aid and abet the growth of the gonococcus; the anatomic arbor-like arrangement of the cervical glands conceal this micro-organism in protective depots for survival. Even against such odds the sulfonamides brought under control a very large number of women with acute and chronic gonorrhea. The exceptions were the females who harbored resistant strains or in whom, because of chronicity of long duration, the gonococcus had taken tenacious hold in the subepithelial layers of the mucosa lining Skene's ducts, Bartholin's glands, the endocervix or the fallopian tubes. Chronicity and chemoresistant strains proved a barrier that sulfonamides frequently failed to overcome.

The early reports of 85 per cent cures of gonorrhea with sulfonamides no longer hold, for the persistence of certain strains which have gradually permeated a selected stratum of the populace has reduced the effectiveness of sulfonamides to little better than 55 per cent. It is further true that improved bacteriologic technics have helped to uncover many carriers of gonococci in spite of complete absence of clinical signs and symptoms.¹ The sign on the door, namely a purulent urethral discharge, is not a worthy criterion on which to base a clinical diagnosis of gonorrheal infection. Too frequently, particularly in the old infected case, is it lacking. Too frequently, in spite of a frank urethral discharge, gonococci are not to be found and other organisms, among them the trichomonad, are common offenders.

Pelouze, the prophet of doom in the sulfonamide wilderness, was haunted by the specter of the carrier and the chemoresistant strain. He continually exhorted medical authorities to beware of the false security into which we have been lulled by sulfonamides. Shall we

1. Koch, R. A.; Mathis, E. N., and Geiger, J. C.: Ven. Dis. Inform. 25: 35, 1944.

of early syphilis must be borne in mind. While most of the patients in this series were beyond the incubation period of primary syphilis, several cases were observed in which it is possible that penicillin affected the development of early syphilis. The most definite instance was that of a patient with a small ulcer at the frenum, to whom 100,000 units of penicillin was administered before the lesion was studied by dark field examination. The dark field examination was negative the day following and the lesion healed rapidly. Six weeks later a typical dark field positive chancre appeared in the same location. The patient denied further sexual exposure. Because of the known effect of penicillin on *Treponema pallidum*, patients receiving penicillin therapy for gonorrhea should be observed clinically and serologically for evidence of syphilis for a period of at least three months.

SUMMARY AND CONCLUSIONS

Studies have been carried out in fifteen selected army hospitals with a view toward determining as rapidly as possible time-dosage factors in the treatment of sulfonamide resistant gonorrhea with penicillin. A total of 1,686 patients refractory to at least two courses of a sulfonamide and in some cases to artificially induced fever were treated with total dosages varying from 40,000 to 160,000 Oxford units per case, the individual dose being 10,000 or 20,000 units intramuscularly every three hours.

These studies showed penicillin to be a remarkably effective drug in the treatment of gonorrhea, usually causing disappearance of symptoms and reversal of bacteriologic findings within forty-eight hours. One course of treatment with a dosage of 160,000 units per case effected cures in 98 per cent, 80,000 to 120,000 units in 96 per cent and 50,000 units in 86 per cent. No significant differences in the final results were noted when a given total dose was administered in individual injections of either 10,000 or 20,000 units. Furthermore, little advantage was gained by prolonging the time of treatment schedules beyond twelve hours.

Factors such as duration of infection, previous fever therapy and race appeared to have no effect on the results of therapy.

Of the total of 126 failures to one course of penicillin, 85 were retreated, using a 100,000 unit dosage. Of these, 78, or 91.8 per cent, were cured. Thus, by retreatment of failures with a second course, 99 per cent cures were obtained. No case in the entire series proved to be penicillin resistant.

Complications of gonorrhea responded well to penicillin, although the more serious forms of complications required prolonged treatment with higher dosage.

Reactions to penicillin were inconsequential, and in no instance was it necessary to discontinue treatment for this reason.

Because of the known effects of penicillin on *Treponema pallidum*, the possibility of masking or delaying the development of early syphilis must be considered.

Finally, it should be recognized that the treatment of gonorrhea has been completely revolutionized in the past few years, first by the introduction of the sulfonamides and, more recently, by the development of penicillin. It is clear that the management of gonorrhea now belongs within the sphere of the chemotherapeutist, and that local treatment is rarely necessary and may do more harm than good.

ABSTRACT OF DISCUSSION

LIEUTENANT COLONEL IRVING S. WRIGHT, M. C., A. U. S.: This compilation of important data represents an encouraging example of cooperation in clinical research. This should encourage others to embark on similar studies when maximum data are needed in the shortest space of time. A few comments, based on experiences at the Army and Navy General Hospital and at many hospitals later visited may prove of interest. In some patients, both male and female, the cultures became negative within four to six hours after the initial dose. Certain of these patients had had profuse discharges, with positive cultures for six months or more. The possibility that the excretion of penicillin in the discharge is a factor in inhibiting the culture growth must be considered. Two patients, both men, had had profuse discharges for months. Smears from each were positive in the usual sense of interpretation; that is, many gram negative intracellular diplococci, which could not be differentiated from gonococci, were found. Cultures failed to grow the organism. One of these patients had twenty-seven negative cultures in a laboratory that grew practically 100 per cent positive cultures in the remainder of the gonorrhea patients. These 2 patients were treated with five and eight courses of sulfonamides respectively, with hyperthermia and with two courses of penicillin of 100,000 units each. This therapy had absolutely no effect on the discharge or on the organisms seen in the smears. The findings suggest that the organism may not be a true gonococcus, but that is as far as we are able to go. I should like to ask Colonel Turner whether he knows of other examples of this group. We have tried penicillin in the treatment of rheumatoid arthritis which arose during the acute phase of gonorrhea and continued after the discharge had ceased. The etiologic classification of these cases is difficult. They differ from the so-called acute gonorrheal arthritis reported in the paper under discussion. The treatment of patients with typical rheumatoid arthritis has been disappointing in our hands. The broader implications arising from the findings of this and similar studies cannot be overestimated. Once more the scientific approach is leading the way, but the problems of its application must be carefully considered. This is easy for members of the armed forces and relatively easy for the professional prostitute. Today, however, our great source of infection is from the amateur pick-up, the girl who comes from a surprising cross section of our population. The widespread use of penicillin in this group must be the result of careful but intense educational programs. A note of caution must be raised, however, against the widespread increase of promiscuity which may arise, with its resultant serious dislocations to our social structure.

DR. JOHN F. MAHONEY, U. S. P. H. S.: It would be an error not to call attention again to the point that the use of penicillin in the treatment of gonorrhea may have the effect of masking or greatly altering the symptoms of the invasion of a concomitantly acquired syphilis. As the product becomes more generally available and more generally used, an increasing number of instances of faulty and delayed recognition of the latter disease probably will be encountered. Repeated serologic tests for syphilis for at least two months following treatment appears to offer the best safeguard, and this feature may well become an important part of follow-up work. In much of the early work with penicillin, investigators have been faced with the necessity of working with limited amounts of the product. This has called forth efforts to refine the dosage to a point where the utmost in results would be produced by each unit available. In the future, and especially if the material becomes as plentiful as now appears certain, the concept that "the dangerous dose is the small dose" will probably gain adherents. The objective will then be to use a sufficient amount of the drug to produce a clinical response as rapidly as possible. In view of the non-toxic character of the substance, the utilization of larger amounts may be accomplished without an appreciable risk of producing untoward symptoms. The questions of total dosage, the duration of treatment, the interval between injections and the number of injections cannot be considered as established at the present even in the light of the favorable results which have been recorded in the present report. Products of greater purity and the development of preparations which are absorbed and excreted less rapidly may have the effect of permitting treat-

ment schedules to be utilized which are less burdensome and as effective as those in use at the present. The impact of the therapy on incidence of gonorrhea and especially on the public health approach to the disease forms an interesting field of speculation. Should the experiences of the future confirm the impressions which are inescapable on the basis of the material at hand, then surely control of the disease through the medium of the venereal disease clinic will require reorientation. A different type of facility may be needed to implement the new therapy. That gonorrhea may cease to be of major public health importance in the none too distant future seems to be an entirely reasonable assumption.

LIEUTENANT COLONEL THOMAS H. STERNBERG, M. C., A. U. S.: The existence or development of penicillin resistant cases of gonorrhea has been a possibility of great interest and of some concern to the Army. In the data presented by Colonel Turner it is of interest that no true instance of penicillin resistant gonorrhea was encountered, provided three courses of penicillin were administered. Since the termination of these studies, many thousands of individuals with gonorrhea have been treated with penicillin in various army hospitals, and particular efforts have been made to uncover cases not responding to adequate penicillin therapy. While such cases are not infrequently reported, investigation reveals that usually they have been labeled as penicillin resistant on the basis of either inadequate penicillin treatment or persistence of a mucoid discharge, which is bacteriologically negative and later proves to be nongonococcal in origin. I have just completed an extensive trip throughout the southwestern portion of the country, visiting numerous army hospitals routinely using penicillin in the treatment of gonorrhea. During these visits the relatively few instances of so-called penicillin resistant gonorrhea were investigated. In most instances the total dosage of penicillin did not exceed 200,000 units, and in no case was it possible to isolate a strain of gonococcus which was resistant *in vitro* to the more concentrated dilutions of penicillin. To date the army experience indicates that the incidence of truly penicillin resistant gonorrhea is at least unusual and further suggests that the term penicillin resistant gonorrhea should be applied cautiously and only after failure to respond to comparatively large doses of penicillin as determined by adequate clinical and laboratory studies.

DR. ALFRED COHN, New York: May I report the essential findings of a study on penicillin therapy in 100 women and 20 men who suffered from sulfonamide resistant gonococcal infections. This study is still in progress in collaborations with my associates Dr. Boris A. Kornblith and Dr. Isaak Grunstein. The 100 women were hospitalized for penicillin treatment at the gynecologic service of Dr. Howard C. Taylor Jr. at Bellevue Hospital. Our studies were directed first toward evaluating the optimal total dosage and second to determine an adequate time schedule for cure. The results of administering various amounts of penicillin in the female group point to the fact that a minimum total dosage of 100,000 Oxford units intramuscularly is both necessary and sufficient for bacteriologic cure. The time schedule that was found to be most satisfactory without failure averaged between six and nine hours. The penicillin was administered either in four intramuscular injections of 25,000 units each or by an initial injection of 50,000 units followed by two injections of 25,000 units each. Twenty ambulatory men who suffered for a number of months from sulfonamide resistant gonococcal infections with chronic complications, 18 with prostatitis and 2 with epididymitis, were treated at the Central Clinic of the Department of Health, City of New York. A total dosage of 100,000 Oxford units of penicillin was administered intramuscularly to all 20 patients. Two schedules of therapy were employed: 1. An initial injection of 50,000 units was followed by two subsequent injections of 25,000 units each at three hour intervals; total time of therapy, six hours. 2. An initial injection of 40,000 units was followed by two subsequent injections of 30,000 units each at two hour intervals; total time of therapy, four hours. Thus far no failure of therapy has been encountered in any of these 20 patients who have been followed up by repeated urethral and prostatic smears and cultures over a period of between two and four weeks. Urethral cultures taken at one hour intervals

after the initial injection of penicillin became negative between the third and fourth hour after treatment was initiated. Smears of urethral discharges showed involution and disintegration of the gonococci and leukocytes by the end of five hours in most cases. Our findings indicate that an adequate minimal dosage of 100,000 units of penicillin administered over a period of from four to six hours to ambulatory patients is a satisfactory routine in the treatment of sulfonamide resistant gonococcal infection.

COLONEL THOMAS B. TURNER, M. C., A. U. S.: In reply to Colonel Wright's question about observing the organisms which do not grow out on culture, we have observed a similar thing in our hospitals. We assume that it is due to the presence of penicillin and that they do not grow out.

PENICILLIN FOR THE TREATMENT OF CHEMORESISTANT GONORRHEA IN THE FEMALE

ROBERT B. GREENBLATT, M.D.

Surgeon (R) U. S. Public Health Service
AND

ANITA R. STREET

Laboratory Director, Southeastern Medical Center, Oatland Island
SAVANNAH, GA.

With the advent of the sulfonamides the eradication of gonorrhea from the human race seemed quite likely. The promise contained in the earlier reports for the treatment of gonorrhea with sulfonamides, however, has not been completely fulfilled. Moreover, the therapeutic results for the female have not been so good as for the male, because of vagaries in her anatomic makeup. The physiologic mucoid alkaline secretions of the cervix aid and abet the growth of the gonococcus; the anatomic arbor-like arrangement of the cervical glands conceal this micro-organism in protective depots for survival. Even against such odds the sulfonamides brought under control a very large number of women with acute and chronic gonorrhea. The exceptions were the females who harbored resistant strains or in whom, because of chronicity of long duration, the gonococcus had taken tenacious hold in the subepithelial layers of the mucosa lining Skene's ducts, Bartholin's glands, the endocervix or the fallopian tubes. Chronicity and chemoresistant strains proved a barrier that sulfonamides frequently failed to overcome.

The early reports of 85 per cent cures of gonorrhea with sulfonamides no longer hold, for the persistence of certain strains which have gradually permeated a selected stratum of the populace has reduced the effectiveness of sulfonamides to little better than 55 per cent. It is further true that improved bacteriologic technics have helped to uncover many carriers of gonococci in spite of complete absence of clinical signs and symptoms.¹ The sign on the door, namely a purulent urethral discharge, is not a worthy criterion on which to base a clinical diagnosis of gonorrheal infection. Too frequently, particularly in the old infected case, is it lacking. Too frequently, in spite of a frank urethral discharge, gonococci are not to be found and other organisms, among them the trichomonad, are common offenders.

Pelouze, the prophet of doom in the sulfonamide wilderness, was haunted by the specter of the carrier and the chemoresistant strain. He continually exhorted medical authorities to beware of the false security into which we have been lulled by sulfonamides. Shall we

1. Koch, R. A.; Mathis, E. N., and Geiger, J. C.: Ven. Dis. Inform. 25: 35, 1944.

be lulled into a similar state of complacency with penicillin? This much is known: that penicillin is an extremely effective bacteriostatic and bactericidal agent, many times more powerful and efficient than the sulfonamides. Much had been expected of other drugs in the past. Penicillin offers much now because it is effective against sulfonamide resistant strains. Will penicillin fast strains develop? Time is of the essence.

MATERIAL

This series comprises 551 females ranging in age from 3 to 48 years, studied at the Southeastern Medical Center during a given period. Of this number 54 per cent were of the Negro race and 46 per cent were white. It is revealing and surprising that 82 per cent of the white females had bacteriologically proved gonorrhea, while a similar diagnosis could be established in only 41 per cent of the Negro women (table 1). Although, comparatively, a far greater number of Negro than white women had clinical evidence of gonorrhea, such as urethritis, induration of the broad ligaments, scarring of the cul-de-sac or pelvic inflammatory masses, nevertheless, the diagnosis was confirmed bacteriologically twice as frequently in white females. Each patient had a minimum of six cultures in an effort to establish a diagnosis of gonorrhea.

One hundred and nine patients in this series were treated with penicillin, and of these 93 per cent had

TABLE 1.—Analysis of Patients Treated with Penicillin

Race	Females Studied for Venereal Diseases		Bacteriologically Proved Gonorrhea		Penicillin Treated	
	Number	Percentage	Number	Percentage	Number	Percentage
White.....	258	46.8	213	82.1	84	39.4
Negro.....	293	54.2	122	41.6	25	20.5
Total....	551	100	335	60.8	109	32.5

had one or more courses of sulfonamides. Several gonorrheic females received penicillin without a full course of sulfonamides because of sensitivity to them. Penicillin was administered on a few occasions without a prior course or completion of a course of sulfonamides because of certain considerations, such as pelvic peritonitis or acute exacerbation of a chronic salpingitis. Penicillin was dissolved in a few cubic centimeters of distilled water or saline solution and administered intramuscularly in 10,000 to 20,000 units at three hour intervals until 60,000 to 150,000 units had been administered. One 3 year old girl received a total of 25,000 units and two 9 year old girls each received 50,000 units. One patient had concomitant granuloma inguinale and received 1 million units (table 2). There were no untoward reactions resulting from penicillin therapy.

It is of interest that proportionately one and one-half times as many white females received penicillin as did Negro females. Following penicillin therapy four or more cultures were taken in 85 per cent of the cases. Cultures were taken daily for the first few days and then at intervals of one, two or more days. On the average 6 to 15 cultures were obtained in the greater number of instances (table 3). In 3 instances follow-up cultures were not obtained, as the patients were sent back for observation to the referring agency immediately after therapy and reports were not available at the time of writing. Five patients received a second course of penicillin because positive gonococcus cultures were obtained after a lapse of five or more days following

the administration of the first course. One of these, however, was not considered as a relapse but rather as a reinfection. The second round of penicillin varied from 120,000 to 300,000 units. These patients remained bacteriologically negative during the period of observation following the second course of therapy and were

TABLE 2.—Dosage and Results of Penicillin Therapy

Dosage of Penicillin	No. of Courses	Relapses
25,000 units.....	1*	0
50,000 units.....	2†	0
60,000 units.....	31	1
75,000 units.....	3	0
100,000 units.....	1	0
120,000 units.....	2	0
150,000 units.....	70	4
250,000 units.....	2	0
300,000 units.....	1	0
1,000,000 units.....	1	0
Total.....	114‡	5

* Age 3 years.

† Two 9 year old girls.

‡ In all, 109 patients; 5 received a second course of penicillin therapy.

dismissed after 6 to 12 cultures as bacteriologically negative for gonorrhea.

The analysis of statistical data in this series reveals two important facts that require further study:

1. A laboratory diagnosis of gonorrhea was established in twice as many white as Negro patients, although the ratio of white to Negro in this series was practically 1:1.
2. Proportionately one and one-half times as many white patients as Negroes received penicillin therapy because of chemoresistance to sulfonamides.

Several questions arise:

1. Is a bacteriologic diagnosis more readily made in white gonorrheic women?
2. Are gonorrheic Negro females more responsive to sulfonamides?
3. Is there a racial factor?

Certain facts must be considered before drawing conclusions. White women are more apt to be seen during the acute phase of gonorrhea, and bacteriologic proof is probably easily obtained during this period. Then again, chronicity of long duration in the Negro group, as evidenced by chronic pelvic inflammatory disease, makes for greater difficulty in establishing laboratory proof of gonorrhea. Failure to obtain a positive gonococcus culture in such cases does not constitute a priori evidence of absence of gonorrhea. In 3 Negro females in whom gonorrhea was suspected, positive cultures were obtained only after the thirteenth, seventeenth and twenty-fourth culture respectively.

TABLE 3.—Cultures Following Courses of Penicillin

	None	1-3	4-5	6-10	11-25	16-20	21-25
White.....	3	12	10	23	21	2	1
Negro.....	0	2	2	13	7	1	2
Total.....	3	14	12	51	28	3	3

Are sulfonamides more specific for gonorrhea in the Negro race? It is the opinion in military circles that this is so, and this view is shared by Pelouze.² This phenomenon may be more apparent than real and is worthy of further study. If such a racial factor exists it may explain the proportionately larger number of white females for whom the administration of penicillin was required because of chemoresistance to sulfon-

2. Pelouze, P. S.: Ven. Dis. Inform. 25:76, 1944.

amides. We feel, however, that this discrepancy is not a real one. The study of the Negro female for a longer period of time, under more rigid tests, such as slight cauterization of the cervix, mild dilatation of the cervical os and repeated pelvic examinations, may yield a greater number of positive cultures in this group during the carrier and asymptomatic state.

ANALYSIS OF RESULTS WITH PENICILLIN THERAPY

Following penicillin therapy the cultures obtained within twelve to twenty-four hours usually were negative. In 9 instances positive cultures were obtained twenty-four hours after penicillin, in 3 after forty-eight hours, in 3 after seventy-two hours and in 4 after ninety-six hours. Patients in whom a positive smear or culture was obtained after the fifth day were considered to be therapeutic failures. In 4 patients positive cultures were obtained on the fourth and ninth days, fifth and seventh days, sixth and ninth days and the eighth day respectively. In 2 others positive smears but negative cultures were obtained, in 1 on the fourth and eighth days and in the other on the tenth day. In reality, 6 patients gave evidence that the gonococcus was not eradicated by the fifth day following penicillin. Positive cultures were obtained in 5 other patients who received penicillin therapy on being checked at various intervals by the referring agency after their dismissal from the hospital. Positive cultures were obtained on the tenth, seventeenth, twenty-first, twenty-fourth and sixtieth days respectively. In each instance it was believed that reinfection rather than a relapse occurred.

It must be said that, following penicillin, urethral discharge and symptoms of vaginitis, salpingitis and pelvic peritonitis frequently abate within twenty-four to forty-eight hours. On the other hand, purulent urethral and cervical secretions continued in many despite absence of bacteriologic proof of gonococcal infection.

CONCLUSIONS

Penicillin is an effective drug for the therapy of chemoresistant gonorrhea in the female. One hundred and nine patients received courses of penicillin; of these, 84 were white women and 25 were Negroes. Five hundred and fifty-one women (46 per cent white and 54 per cent Negroes) were studied for venereal diseases and in 61 per cent laboratory evidence to support the diagnosis of gonorrhea was obtained. Proportionately, one and one-half times as many white women received penicillin for chemoresistant gonorrhea. The impression that Negro women are more responsive to sulfonamides is more apparent than real. During the period of observation in this series, therapeutic failures were obtained in 5 women following penicillin. A favorable response was obtained after a second course of therapy.

The excellent results that are being obtained now with penicillin will not engender, it is hoped, too great a degree of optimism.³ The dosage of penicillin should

not be reduced to the minimum necessary for good results. It should be maintained at a sufficiently high level so that the development of penicillin resistant strains may be thwarted.⁴ To this end it is recommended that 150,000 units be used, although good results may be obtained with as little as 60,000 units. A warning note is sounded that asymptomatic carriers may develop and that penicillin resistant strains of gonococci may appear.

THE ROLE OF THE SKIN AND CORNEAL LAYER IN EDEMA FORMATION

G. E. BURCH, M.D.

AND

TRAVIS WINSOR, M.D.

NEW ORLEANS

With the present exacerbation of interest, because of the war, in the physiology of shock, of burns, of blood vessels and edema and of water and electrolyte balance it was considered advisable to review the role of the skin and especially the thin dead corneal layer of the epidermis in these states.

In the evaluation of the factors concerned with the regulation of edema formation, the role of the skin is neglected. The importance of the skin becomes apparent when the extravascular physical factors involved in edema are considered. The importance of tissue pressure in the regulation of edema formation is generally accepted today.¹ Tissue pressure becomes increasingly important as edema fluid accumulates,² ultimately becoming one of the most important factors inhibiting further progress of the edema. This is obviously true, for when the volume of intracellular and extracellular fluid accumulates the tissues become separated and the volume of the part increases. Because of the fibrous connective tissue, trabecules, blood vessels, nerves, lymphatics, tendons, muscle and other structures, the tissues tend to be held together and resist separation, thus resulting in an increase in the hydrostatic pressure of the tissues. As greater volumes of edema fluid gather, the absolute value of the tissue pressure increases, attaining extremely high values at times.²

It was also shown previously³ that the skin is an important factor which limits the accumulation of edema fluid. As edema fluid gathers in the tissues the part distends, the tissue pressure increases and the skin is stretched, exerting a counter force against the tissues and fluids within. This counter force contributes to the tissue pressure and thereby tends to limit edema formation. The resistance to distention or stretching offered by the skin reflected by the aforementioned counter force is most probably maintained to a larger extent by the fibrous connective tissue of the corneum, with the layers of the epidermis contributing a lesser but significant part. The role of the skin in the physical

3. Cohn, A.; Studdiford, W. E., and Grunstein, I.: Penicillin Treatment of Sulfonamide Resistant Gonococcal Infections in Female Patients, *J. A. M. A.* 124:1124 (April 15) 1944. Herrell, W. E.; Cook, E. N., and Thompson, L.: Use of Penicillin in Sulfonamide Resistant Gonorrheal Infections, *ibid.* 122:289 (May 29) 1943. Cook, E. N.; Pool, T. L., and Herrell, W. E.: *Proc. Staff Meet., Mayo Clin.* 18:433 (Nov. 17) 1943. Mahoney, J. F.; Ferguson, C.; Buchholtz, M., and Vau Slyke, C. J.: *Am. J. Syph., Gonorr. & Ven. Dis.* 27:525 (Sept.) 1943. Robinson, N. J.; *Brit. M. J.* 2:635 (Nov. 20) 1943. Vau Slyke, C. J.; Arnold, R. C., and Buchholtz, M.: *Am. J. Pub. Health* 33:1393 (Dec.) 1943. Penicillin in War Wounds: A Report from the Mediterranean, *Lancet* 2:743 (Dec. 11) 1943; The Treatment of War Wounds with Penicillin, *Brit. M. J.* 2:755 (Dec. 11) 1943. Strauss, H.: *Am. J. Obst. & Gynec.* 47:271 (Feb.) 1944.

4. Mahoney, J. F.: Communication to Medical Director, Venereal Disease Division, United States Public Health Service. From the Department of Medicine, Tulane University School of Medicine, and the Charity Hospital of Louisiana.

1. Peters, J. P.: *Body Water: The Exchange of Fluids in Man*, Springfield, Ill., Charles C. Thomas, Publisher, 1935, p. 52. Burch, G. E.: Formation of Edema in the Eyelids of Man, *Arch. Int. Med.* 65:477 (March) 1940. Warren, J. V.; Merrill, A. J., and Stead, E. A., Jr.: The Role of the Extracellular Fluid in the Maintenance of a Normal Plasma, *J. Clin. Investigation* 22:635, 1943. Burch and Sodeman.

2. Burch, G. E., and Sodeman, W. A.: The Estimation of the Subcutaneous Tissue Pressure by a Direct Method, *J. Clin. Investigation* 16:845, 1937.

3. Sodeman, W. A., and Burch, G. E.: A Method for the Estimation of Skin Distensibility with Its Application to the Study of Vascular States, *J. Clin. Investigation* 17:785, 1938.

limitation through the medium of tissue pressure is well known to every one who has seen the shiny smooth skin of the edematous leg and the wrinkled rough skin of the same leg after the edema has disappeared.

Once a part such as a leg has become fully distended and the skin has reached its limits of distention, the escape of fluid from the blood vessels cannot be any greater than the return of tissue fluid to the blood vessels unless the skin breaks and allows the escape of fluid to the outside. This phenomenon is well known clinically in patients with pronounced edema of the legs in whom the epidermis of the skin of the legs cracks and "weeps" edema fluid continuously until the edema state is relieved. It is usually only under such conditions that one is aware of the role of the epidermis in the limitation of quantity of water lost from the blood vessels. The epidermis of the skin, however, is continuously active as a factor inhibiting water loss from blood vessels in that it inhibits the loss of fluid from the tissues outside and in turn from the vascular system by preventing diffusion and oozing of water into the atmosphere. The importance of this influence is well known in burns and has been studied recently in living and dead skin.⁴ Although this role of the skin is active in the normal subject, its influence becomes even more significant quantitatively in the presence of edema, increasing in importance as the edema increases.

It was found⁵ that the corneal layer of the epidermis, a layer of microscopic thickness except in the palms and soles, was the layer of the skin that was of greatest importance in the inhibition of water loss by diffusion from the underlying tissues of the part. Nicheing the corneum of the skin of an edematous part permits the underlying edema fluid literally to flow at times as it escapes from the body. This is more vividly exemplified by the puncture of a blister cap, with the rapid escape of blister fluid. These simple experiments as well as others⁴ indicate the significant and peculiar role of the corneum in holding fluid within the body, thereby maintaining tissue pressure, inhibiting edema formation and the loss of vascular fluid.

In normal physiologic states⁶ little water diffuses through the epidermis of the skin. This is true even in the presence of much underlying edema fluid and the existence of pronounced distention of the corneum. This is again illustrated nicely by a blister.⁴

Were it not for the overlying very thin layer of corneum, fluid that escapes into the tissue spaces would diffuse through the skin to the outside and tissue pressure would not rise appreciably if at all. Fluid would also continuously escape from the blood vessels, upsetting water balance and electrolyte balance and resulting in pronounced disturbances in normal physiologic states. Further action of the corneal layer of the epidermis and the skin as a whole in local and general water and electrolyte balance is obvious from the previous discussion.

It is therefore well to remember that the "dead," keratinous, ever desquamating, thin corneum enjoys a

significant role in human physiology not only by protecting the body from trauma, bacterial invasion and the like but also in the maintenance of a normal water and electrolyte balance; the latter functions of the corneum are rarely if ever appreciated. There is a need for a better understanding of the physiology of the skin as well as a need for more careful and scientific care of the skin both in health and in disease and especially by quantitative and qualitative evaluation of its part in edema formation. Because as a general rule the corneum remains intact is no reason why it should be neglected in the consideration of problems of water balance.

Clinical Notes, Suggestions and New Instruments

ORBITAL CELLULITIS TREATED SUCCESSFULLY WITH PENICILLIN

H. O. SLOANE, M.D., PHILADELPHIA

Associate in Ophthalmology, Jefferson Medical College; Ophthalmologist to the Doctors Hospital

Orbital cellulitis is an inflammation of the retrobulbar tissue. It is an acute disease and usually begins with serious general symptoms, fever and pain. The lids are swollen; the conjunctiva is chemotic and the eyeball is usually displaced in the direction of the orbital axis and its mobility is impaired. This is due partly to mechanical protrusion and partly to simultaneous infiltration of the muscles and paresis of the nerves. Pain is dull in character and increased by movements of and pressure on the eyeball; but there are no points of tenderness, such as are encountered in periostitis and sinusitis.

The course of the disease may vary; the condition may appear threatening, yet no suppuration takes place. In other cases pus perforates in a very short time through the lid or conjunctiva, producing a fistula which may heal quickly or last a long time.

ETIOLOGY

This condition may be caused by traumatism. A foreign body such as a sharp stick or the point of a pencil may be driven through the conjunctiva into the orbit and broken off, where it may be hidden and leave no visible wound or other trace.

Mumps, tonsillitis, puerperal fever and other infectious diseases may also cause the condition, as well as dacryocystitis, thrombophlebitis of the facial veins or a panophthalmitis. In 60 per cent of the cases (according to Foster) it originates from an inflammation of one of the accessory sinuses. The direction in which the eyeball is displaced is helpful in determining which sinus or sinuses are involved.

BACTERIA

The principal bacteria found are the staphylococcus and streptococcus, but the pneumococci and the typhoid and pyocyanus bacilli may also be found.

COURSE OF THE DISEASE

This is a dangerous disease and may lead to blindness and even loss of life. Blindness may be caused by thrombotic embolism of the retinal vessels. Hemorrhages and optic atrophy may be observed. The condition may be produced by circulatory disturbances, compression of the optic nerve or toxic effects. Thrombophlebitis of the central vein plays an important part.

There may also be corneal complications, with perforating ulcers and phthisis bulbi.

Read before the Section of Ophthalmology, College of Physicians, April 20, 1944.

The medical department of the Jefferson Hospital assisted in the treatment of the patient.

4. Burch, G. E., and Winsor, T.: Rate of Insensible Perspiration (Diffusion of Water) Locally Through Living and Dead Human Skin, Arch. Int. Med., to be published. Winsor and Burch.

5. Winsor, T., and Burch, G. E.: A Study of the Relative Role of the Layers of the Human Epigastric Skin on the Diffusion Rate of Water, Arch. Int. Med., to be published.

6. Erisman, F.: Zur Physiologie Wasserverdunstung von der Haut, Ztschr. f. Biol. 11:1, 1875. Burch, G. E., and Winsor, T.: Unpublished observations. Winsor and Burch.

OTHER COMPLICATIONS

Meningitis, abscess of the brain or thrombosis of the cavernous sinus may cause death and, according to Birch-Hirschfeld, does so in about 17 per cent of the cases.

REPORT OF CASE

History.—Charles C., aged 12, attended school on (Tuesday) Jan. 25, 1944. During the afternoon he complained of feeling ill and having a headache and some fever. He was visited by his family physician (Dr. Joseph A. Seiden), who could find nothing definitely wrong except that the child had an increase in temperature. On the following day, January 26, the lids of the left eye began to protrude and there was considerable proptosis of the eyeball accompanied by chemosis of the conjunctiva and pronounced edema of the lids.

I was called in consultation on Friday, January 28. On examination I found pronounced redness, swelling and edema of the lids of the left eye, with an extensive chemosis of the conjunctiva. The eyeball was proptosed about 15 mm. anterior to the right eye and was immobile. The pupil was dilated to 8 mm. but reacted to light. The tension of the eyeball was normal.

The ophthalmoscopic examination of the right eye revealed no pathologic change. The left eyeground showed a definite fullness of the optic disk, with considerable hyperemia. The veins were distended, broad and tortuous. The disk outlines were distinct. There were no hemorrhages or exudates present at this time.



Fig. 1.—Appearance of patient with cellulitis of the left eye on Feb. 1, 1944, the fifth day of disease.

I made a diagnosis of cellulitis of the left orbit and sent the patient to the Jefferson Hospital for further study and surgical treatment.

He was admitted to the hospital on January 29. His temperature was about 102 F. The pulse and respiration were rapid. He was examined by Dr. Warren B. Davis of the ear, nose and throat department the next morning, who found exophthalmos with lateral displacement of the left eyeball,

edema of the conjunctiva and inflammation of both lids. The upper, middle and lower turbinates in both nostrils were boggy and obstructed drainage. The left nasal passage was filled with purulent exudate. Dr. Davis advised a good sized opening of the left antrum under the turbinate, with removal of the left middle turbinate and part of the left wall of the ethmoid. Dr. Davis felt it probable that pressure from the purulent



Fig. 2.—Appearance on March 29, after treatment with penicillin.

exudate had shoved the periosteum of the ethmoid away from the bone, thus pushing the orbital structure forward then laterally.

The patient was seen also by Dr. Wagers, who agreed with Dr. Davis and who arranged to operate on the following afternoon.

X-ray findings at this time, January 29, reported by Dr. Teplick, showed a large amount of fluid in the left antrum and the left ethmoid quite cloudy. There was no evidence of osteomyelitis or bone destruction. The right antrum and ethmoid were relatively clear. The frontal sinus was undeveloped.

Blood Studies.—When the patient was admitted, a white cell count was made and found to be 12,000. On January 31 another blood study was made, which disclosed hemoglobin 71 per cent, white blood cells 9,300, lymphocytes 21, monocytes 1. Blood culture showed no growth in forty-eight hours. A conjunctival swab taken on February 1 showed *Staphylococcus aureus* and *Bacillus xerosis*. A swab taken from the maxillary antrum showed 240 colonies of *Staphylococcus aureus*.

General Examination.—The boy was severely ill. Aside from the cervical adenopathy on the left side and the condition of his left eye, everything proved to be normal.

His past history revealed that he had mumps, measles, chickenpox and bronchopneumonia. The family history was negative.

Treatment.—When I first saw the patient, I immediately ordered sulfadiazine in fairly large doses. This was continued from January 28 until the 31st, when he was given penicillin. The sulfadiazine was discontinued, as he appeared to show no improvement from its use. During the first twenty-four hours 100,000 units of penicillin was administered intravenously; there-

after, 50,000 units every twenty-four hours daily. This treatment was given from January 31 to February 9 inclusive. He received a total of about 500,000 units of penicillin.

Course of the Disease.—Following the first injection of penicillin the patient began showing improvement both locally and generally. The temperature showed improvement and continued to waver between 99.3 F. and normal. The pulse was correspondingly down from 110 to 80, varying, however, sometimes going up to 100 or more.

The local condition of the eye continued to show improvement. The edema and chemosis subsided gradually; the eyeball began to recede, and some motility was present on the third day after the penicillin was started. On February 12 the left eye was open. No photophobia or diplopia was present. Eye swelling, redness and chemosis were very much less. The temperature, pulse, respiration and blood pressure showed a normal range. The last culture of the left maxillary antrum showed no growth in the last forty-eight hours.

X-ray examination on February 10, as reported by Dr. Teplick, revealed complete clouding of the left antrum, also of the left ethmoids, although not as cloudy as on the previous examination.

The patient remained in the hospital until February 19. At this time the local condition of the eye was nearly normal. The eyeground showed much improvement. The optic disk was almost entirely clear and the color was normal. There was some tortuosity of the veins still present but not pronounced. The motility of the eye was good in all directions, and the patient could open and close his lids at will. Vision in both eyes was normal.

SUMMARY AND COMMENT

In a case of orbital cellulitis of the left eye in a boy of 12 the cause was established to be sinusitis involving the left ethmoids and the maxillary antrum. Operation was contemplated both for the sinus condition and locally to establish drainage and relieve the inflammation and swelling of the orbital tissues. However, under the continued use of penicillin intravenously for a period of ten days the condition cleared up completely, so that it was unnecessary to operate. Sulfadiazine in fairly large doses was tried without affecting the disease in any way and was discontinued when penicillin was administered. Local treatment was limited to applications of hot magnesium sulfate solution continuously and instillation of atropine sulfate 1 per cent three times daily.

1717 Pine Street.

BRONCHIAL ASTHMA AS A MANIFESTATION OF SULFONAMIDE SENSITIVITY

Theron G. Randolph, M.D., Chicago, and Frank F. A. Rawling, M.D., Ann Arbor, Mich.

As far as can be determined, convincing evidence of bronchial asthma as a manifestation of sulfonamide sensitivity has not been described, although it has been mentioned in this respect.¹

We report 2 cases, each with a history of asthma following the ingestion of a sulfonamide drug. In 1 instance the trial ingestion of sulfathiazole produced a severe paroxysm of asthma; in the second case the trial ingestion of sulfadiazine, although not producing clinical asthma, resulted in a definite diminution in the vital capacity.

CASE 1.—F. F., a man aged 44, a metal worker, was admitted to the University Hospital in status asthmaticus Sept. 21, 1943. The history as obtained from the patient and his local physician revealed that seven days prior to admission he had sought advice regarding a chronic nasal infection, presumably resulting from plucking nasal hairs. Large white tablets were prescribed

with instructions to take two every four hours, also ephedrine nose drops containing 2.5 per cent sulfathiazole.

Within twenty-four hours he developed a generalized rash, rhinorrhea, nasal stuffiness and conjunctival injection with periorbital edema. The unidentified tablets were then changed to sulfathiazole 0.65 Gm. every four hours, which was continued for a period of three days. The sulfathiazole nose drops were used in addition for a total period of seven days.

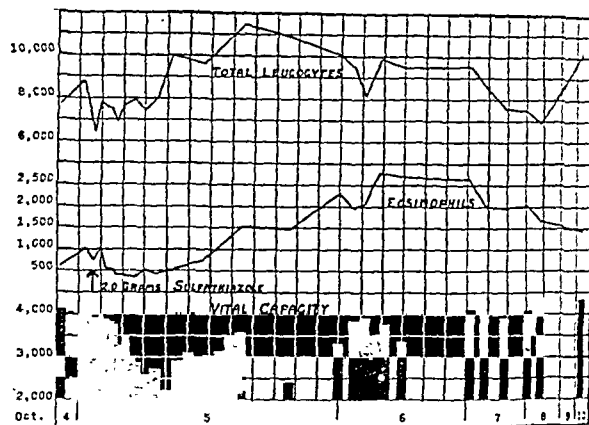


Chart 1.—Blood and vital capacity response following the trial ingestion of sulfathiazole (2 Gm.) in case 1.

His reactive symptoms were most pronounced the second day, thereafter subsiding to the point that he was feeling well by the fifth day and he returned to work on the sixth. At 10 p. m. of the seventh day of sulfathiazole therapy, September 20, he suddenly started to cough, followed by wheezing and dyspnea. These symptoms progressed alarmingly and were not relieved by epinephrine, ephedrine or morphine. He was admitted at 4:30 a. m. September 21.

There was no evidence of asthma or other allergic manifestations in his past or family history. There had been no previous treatment with sulfonamides as far as the patient or his physician was aware. Previous sulfonamide therapy cannot be excluded, however, as he had treated his nasal condition locally with numerous unidentified proprietary medications in the preceding six months.

On admission he exhibited extreme dyspnea and wheezing. Examination revealed the typical features of bronchial asthma, and there were no abnormal cardiac findings. The blood pressure was 130 mm. of mercury systolic and 100 diastolic. Laboratory data, including stereoscopic x-ray examination of the chest, were not outside normal limits.

He remained in status for three days in spite of rigorous treatment, including oxygen therapy, aminophylline intravenously and ether and oil by rectum. He did not become symptom free until a week after admission.

On his fifteenth hospital day, after he had been asymptomatic for a week, he voluntarily ingested 2 Gm. of sulfathiazole in a fasting condition. Within seven hours his vital capacity dropped from an initial level of 4,000 to 2,150 cc. At two hours he first complained of somnolence. At two and one-half hours he noted a sensation of heaviness in his chest. Four hours after ingestion he developed his initial coughing and dyspnea, sibilant rales were detected on chest examination for the first time and his vital capacity fell to 2,950 cc. Symptoms of asthma persisted for a total of twelve hours; cyanosis was present when the vital capacity was at the lowest level. With the exception of a reading of 2,350 cc. obtained on awakening the patient at 3 a. m., the vital capacity gradually returned to the preingestion normal within a period of forty-eight hours.

Total leukocyte and eosinophil counts were determined every half hour for the first three hours, hourly during the next three hours and at less frequent intervals for a total of 127 hours. A diluent of phloxine and methylene blue dissolved in equal parts of propylene glycol and water, previously described by

Technical assistance was rendered by Miss Carol L. Stanton. From the Allergy Clinic, Department of Internal Medicine, University of Michigan Medical School. This study was financed in part by the Parke, Davis and Company.

1. Ratner, B.: Allergy, Anaphylaxis and Immunotherapy: Basic Principles and Practice, Baltimore, Williams & Wilkins Company, 1943. Leftwich, W. B.: An Intradermal Test for the Recognition of Hypersensitivity to the Sulfonamide Drugs, Bull. Johns Hopkins Hosp. 74: 26, 1944.

one of us,² was used in these determinations. With this method the eosinophils stain in the counting chamber; their enumeration in the same sample as used in determining the total leukocyte count gives more accurate values than obtained in the differential counts from stained films.³ The number of eosinophils per cubic centimeter of blood was obtained by counting the cells in nine squares of the counting chamber and multiplying by 22.2. Control counts were made from Wright stained films.

Variations in the blood findings and vital capacity are shown in chart 1. The preingestion total leukocyte count of 8,750 fell to 6,400 cells per cubic millimeter at one-half hour and then returned to the previous level. A count of 9,950 was obtained thirty minutes after the first food was taken at 4 p. m. Higher counts were obtained later, but a return to the preingestion normal did not occur until the third day.

The eosinophils showed a slight rise in the first hour (11.2 to 13.2 per cent); at the end of three hours they fell to 4.1 per cent, from which there was no significant change until ten and one-half hours. Successive counts thereafter showed a surprising rise to 29 per cent at thirty-five hours. A high level was maintained for the succeeding forty-four hours and was still elevated (14.0 per cent) at the conclusion of the period of observation. In chart 1 the eosinophil counts are plotted in absolute numbers.

The patient has remained free from asthma for the ensuing eight months period.

CASE 2.—M. M., a white woman aged 34, a secretary, gave a history of infantile eczema occurring during the winter months from the age of 5 to 7.

In May 1937 she moved to an old house and in August developed rhinorrhea, sneezing, itching of the nose and eyes and intermittent nasal obstruction. Asthma occurred for the first time in November and continued intermittently through the winter in spite of house dust hyposensitization and wheat avoidance. Trial ingestion of wheat precipitated increased rhinitis and asthma. In February 1939 she moved to a new house, and although the rhinitis continued it remained distinctly less troublesome and she had only two attacks of asthma after making this change.

In October 1941 she was hospitalized because of a complaint of chest pain accompanied by a temperature of 102.5 F. X-ray evidence suggested pneumonia. Pneumococci could not be

more pronounced and persisted for eleven days. On the fifth day a sore throat developed, followed on the seventh by nausea, backache and extreme fatigue, and the ninth day by a fine macular erythematous rash over the arms, back and buttocks. At this time cyanosis and dyspnea become more pronounced and she was placed in an oxygen tent. In spite of this measure the difficulty in breathing increased; the rash also became more prominent and generalized. Sulfadiazine was discontinued at this point. In the following twenty-four hours her breathing became easier and the cough more productive. Forty-eight hours after the drug had been stopped the headache and rash subsided. The fever, which had ranged between 100.0 and 101 F., returned to normal coincident with general improvement. However, extreme fatigue persisted for several days.

A total leukocyte count of 6,600 cells per cubic millimeter on admission prior to sulfadiazine therapy decreased to 4,800 on the fifth day but later returned to an average count of 7,000. The maximum count was 8,700 cells per cubic millimeter.

In December 1942 she had an upper respiratory infection associated with soreness of the throat of two weeks' duration. She received one dose of sulfadiazine (0.5 Gm.) at 1 p. m. At 4 o'clock she noticed flushing of the face and mild dyspnea, which progressed into severe asthma, her first attack in over three years. By 6 o'clock she had a fever of 101.0 F. and complained of fatigue, backache and generalized joint pains. Asthma persisted throughout the night. The following morning all symptoms had subsided except for residual fatigue and, incidentally, the soreness of the throat, which had not changed. Blood counts were not taken.

She had had no other sulfonamide therapy until she volunteered to take 0.5 Gm. of sulfadiazine at 9:30 a. m. Feb. 5, 1944. The drug was taken fasting, and similar studies were made as in the preceding case.

As may be noted in chart 2, a precipitous fall in the total leukocyte count occurred at one-half hour. From a preingestion level of 3,200 cc. the vital capacity fell to 2,300 two and one-half hours after ingestion, at which time she noticed flushing of the face. A frontal headache developed at three hours; this gradually became more severe and finally wore off at ten hours. Somnolence and fatigue followed. There were no residual symptoms the following day, although the vital capacity did not return to normal until forty-eight hours had elapsed. Aside from this measurement there was no other evidence of bronchial asthma. The temperature remained normal throughout the period of observation. As may be noted from chart 2, the initial neutropenia was followed by an increase to the preingestion level, from which the count gradually fell to between 6,000 and 7,000 per cubic millimeter. The eosinophil count decreased from a preingestion value of 3.7 per cent to 2.6 per cent at the height of symptoms at three and one-half hours, from which it increased to a maximum of 7.4 per cent twenty-five hours after taking the drug.

COMMENT AND SUMMARY

Two cases of bronchial asthma resulting from sulfonamide sensitivity were observed. In 1, status asthmaticus developed in a person with a negative past and family history of allergy on the seventh day of sulfathiazole nasal therapy. Two weeks after cessation of the drug and after the patient had been asthma free for a period of a week, a trial dose of sulfathiazole reproduced a typical asthmatic paroxysm, as measured by a drop in the vital capacity and confirmatory physical findings.

In a second case with a previous history of atopic dermatitis, allergic rhinitis and bronchial asthma, there was a recurrence of asthma after the first dose of the second attempt to prescribe sulfadiazine. Trial ingestion of the drug a year later resulted in a diminution of the vital capacity but no other evidence of asthma.

The eosinophils in both cases diminished during the stage of reactive symptoms but increased to relatively high levels twenty-four to forty-eight hours after ingestion.

700 North Michigan Avenue, Chicago—University Hospital, Ann Arbor, Mich.

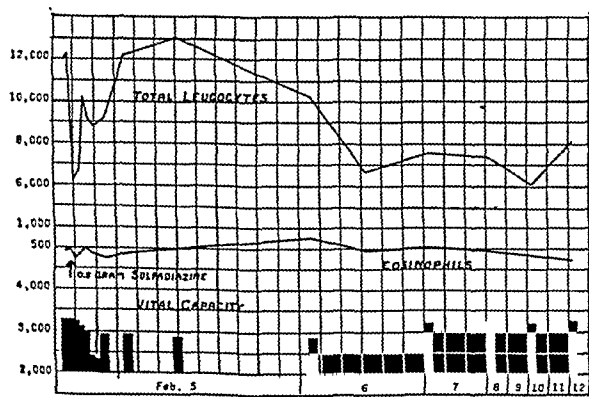


Chart 2.—Blood and vital capacity response following the trial ingestion of sulfadiazine (0.5 Gm.) in case 2.

demonstrated as the causative organism, and a diagnosis of streptococcal pneumonia was made. She was treated with 6 and later 8 Gm. of sulfadiazine daily for a ten day period, receiving a total of 67 Gm. Twenty-four hours after the drug was started she complained of a dull headache, which gradually became

² Randolph, T. G.: Enumeration and Differentiation of Leukocytes in a Counting Chamber and Propylene Glycol-Aqueous Stains, *Proc. Soc. Exper. Biol. & Med.* 52:20, 1943; *Blood Studies in Allergy: I. The Direct Counting Chamber Determination of Eosinophils by Propylene Glycol-Aqueous Stains*, *J. Allergy* 15:89, 1944.
³ Randolph, T. G., and Stanton, C.: A Comparison of the Counting Chamber and Film Methods of Enumerating Eosinophils, to be published.

Council on Foods and Nutrition

The Council on Foods and Nutrition has authorized publication of the following report.

GEORGE K. ANDERSON, M.D., Secretary.

MARGARINE FORTIFIED WITH VITAMIN A

Margarine, sold under the legal designation "oleomargarine," is manufactured in forty-three plants primarily as a table fat or spread for bread, although it is also offered for baking and cooking. Present day margarine is the product developed through (1) improved methods of refining and processing fats, resulting from the additional knowledge of the chemistry of fats and oils, and (2) the application of nutritional research.

The first commercial production of margarine is recorded as by the Frenchman Mege-Mouries in Paris in 1870, who had earlier developed the product. The French government had assigned to him experimental work with fats as part of the effort to produce a cheaper product which would serve in place of butter in the domestic economy. The early product was made principally with oleo oil, but soon neutral lard and vegetable oils were used. With the development of hydrogenation first coconut oil and then other vegetable oils soon dominated the field. The accumulated knowledge and skill have made possible the utilization of the many domestic fats and oils which have been made available under present wartime conditions.

The legal definition and standard of identity of oleomargarine permits the use of animal or vegetable fat, oil or stearin or combinations of them to give not less than 80 per cent fat in the finished product. The fat ingredients are usually mixed with skim milk, although dried skim milk and water, milk or cream are permitted. Optional ingredients which are usually present and must be declared on the label are sodium benzoate (preservative), artificial flavoring, diacetyl or starter distillate, lecithin or monoglycerides and diglycerides, and salt. The use of artificial coloring has recently increased appreciably. The addition of vitamin A as fish liver oil or as a concentrate of vitamin A from fish liver oil is authorized, but this is still on an optional basis, although, when added, the finished product must contain not less than 9,000 U. S. P. units of vitamin A per pound.

The oils and fats used in the manufacture of margarine have varied widely over the years, and this may be expected in the future as availability and low prices are controlling factors. The factor of suitability is becoming a relatively less serious problem as technology overcomes the difficulties presented by the use of certain oils. This is currently being demonstrated by the improved keeping quality of margarine containing large amounts of soybean oil. The variation in the fat component of margarine as an indication of the industry's ability to adapt to changing conditions is illustrated by the consumption of foreign and domestic oils. In 1933 more than 75 per cent of the oil used in margarine was imported coconut oil. During that year the use of soybean oil was negligible, and only 9 per cent of cottonseed oil was used. In 1942 the use of coconut oil had dropped to 1 per cent, and none was used during 1943. In the latter year 90 per cent of the oil used in margarine consisted of cottonseed (50.4 per cent) and soybean (39.6 per cent) oils.

Margarine has long been a factor in the diet of a substantial group of persons, and with the wartime shortages of other spreads for bread it has increasing nutritional importance to a very large percentage of the population. The production of margarine has increased from the ten year (1930-1939) average of 312,675,325 pounds and 300,803,741 pounds in 1939 to 613,974,107 pounds in 1943, or 196.4 per cent of the production four years ago. Margarine contributed last year 3.2 pounds per capita of a total food fat disappearance of 45.8 pounds per capita and of total table fat consumption of 15.2 pounds per capita.

Thus, margarine represented 7.0 per cent of the total food fat and 21.1 per cent of the total table fat. The digestibility (rate or completeness of digestion) of the various food fats shows only small differences. In the case of the table fats factors of 96 to 97 found throughout scientific literature indicate equal digestibility.

The early deficiency of vitamin A in margarine has been corrected, primarily because of the application of the full force and influence of nutritionists throughout the country on the problem. The beginning of the widespread use of vitamin A in margarine dates from the authorization of its use in margarine manufactured in plants under Federal Meat Inspection in February 1941 and adoption of the Definition and Standard of Identity for Oleomargarine in June 1941. It is estimated that 85 per cent of the margarine was fortified by vitamin A during 1942. This increased to over 90 per cent in 1943, and industry reports indicate that now more than 99 per cent of the margarine sold to civilians contains not less than 9,000 U. S. P. units of vitamin A per pound. All of the nearly 90 million pounds purchased by federal agencies in 1943 was required to be so fortified. A small percentage of the total production classed by industry as "industrial sales" and sold to bakers and other establishments is unfortified. The Bureau of Human Nutrition and Home Economics recently estimated for 1943 an average of 7,000 international units of vitamin A per capita daily to have been available from food. Fats and oils, the bureau estimates, contributed approximately one tenth of this amount, but practically all of it was from table fat, as the vitamin A from other food fat is negligible. The compulsory addition of vitamin A is a needed safeguard equal in importance to the minimum fat requirement of the official standard.

The fact that margarine is cheaper to produce than butter is nutritionally important, and attempts to stigmatize it or restrict its distribution are undesirable. The Council is concerned wholly with nutritional value, and no consideration has been given to the economic effect of taxes reducing the margin of cost between the two products or their elimination. A continued demand that the two products be clearly identified may be expected, and this should be required; but the drastic, though effective, control of misrepresentation through fiscal measures of license and tax is still in controversy.

Many of the brands of margarine fortified with vitamin A have carried on the labels the seal of acceptance of the Council, indicating the accepted nutritional value of the product and the cooperation of the firms in adding vitamin A. In July 1943 the Council voted to restrict its scope primarily to those "special purpose" foods which have a definite relation to specific medical and health problems. Because of this action the seal will not be authorized on general purpose foods, including margarine, after the interval permitted to dispose of present stocks of containers. Advertising of these products which is concerned with nutritional education will continue to be considered and permitted to carry the seal on acceptance of the nutritional statements.

The Council takes this opportunity to reaffirm its confidence in the nutritional value of margarine containing vitamin A as follows:

1. Margarine contributes primarily fat to the diet.
2. The fat is equal in digestibility and caloric value to other food fats.
3. The standardized vitamin A content of fortified margarine was so set that it contributes this nutritional factor in amount equivalent to average butter in accordance with information available at that time. (Recent surveys indicate a higher average value for butter.)
4. The milk solids other than fat (1 per cent) present in both butter and margarine are of negligible nutritional importance.
5. When margarine is fortified with vitamin A the investigations that have been made lead to the conclusion that it can be substituted for butter in the ordinary diet without any nutritional disadvantage.

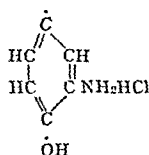
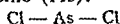
Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN E. SMITH, M.D., Secretary.

DICHLOROPHENARSINE HYDROCHLORIDE.—Clorarsen.—“Dichlorophenarsine Hydrochloride, when dried in a vacuum desiccator over phosphorus pentoxide for twenty-four hours, contains not less than 25.3 per cent and not more than 27 per cent of total arsenic (As).”—U. S. P.



“Dichlorophenarsine Hydrochloride is usually distributed as a mixture with buffering agents and suitable substances to render its solution physiologically compatible with human blood. The label must indicate the names of the admixed substances, and the composition of the mixtures (containing Dichlorophenarsine Hydrochloride as the only active therapeutic agent) shall be approved by the National Institute of Health. Mixtures contain total arsenic equivalent to not less than 92.5 per cent and not more than 107.5 per cent of the labeled amount of Dichlorophenarsine Hydrochloride. Mixtures also meet the requirements for identification, loss on drying, thermostability, completeness of solubility and storage.

“Dichlorophenarsine Hydrochloride and its mixtures must be prepared in an establishment licensed for the purpose by the United States government upon the recommendation of the Surgeon General of the United States Public Health Service. Each lot of the product before being offered for sale must comply with the toxicity, labeling and other requirements of the National Institute of Health, and be released by the Institute.”—U. S. P.

For description and standards see the U. S. Pharmacopeia under Dichlorophenarsinae Hydrochloridum.

Actions and Uses.—In recent literature may be found reports of an arsenical antisyphilitic agent which apparently was discovered in the early part of this century but was cast aside as being too toxic for clinical use. Some years later there were published reports on its use in animals and in the treatment of yaws and human syphilis. It was not until 1941 that 3-amino-4-hydroxyphenyl dichloro-arsine hydrochloride was found satisfactory for the treatment of syphilis; apparently the earlier studies were based on the use of an unbuffered compound which would provide a very low *pH*.

The preparations now available on the market contain sufficient alkaline buffering agent to make neutral a prepared solution for injection. They contain approximately 26 per cent of trivalent arsenic. On the addition of sterile distilled water to an ampul containing the mixture of dry dichlorophenarsine hydrochloride and alkaline buffer a reaction takes place, with the result that arsenoxide is supposed to be formed. It has been claimed that the latter agent is the therapeutically active part of the compound.

(A preliminary report of the Council appeared in THE JOURNAL, Sept. 25, 1943, p. 208.)

Dosage.—Initial dose 0.03 Gm. for women and 0.04 Gm. for men intravenously. The second dose may be increased to 0.04 Gm. for women and 0.06 Gm. for men. The maximum dose may be regarded as 0.06 Gm. Injections may be given every four to five days, as it is excreted rapidly.

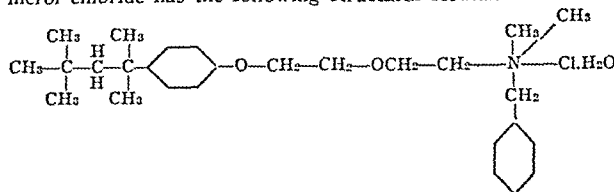
For children, the initial dose should not exceed 0.5 mg. per kilogram of body weight; the later doses should average between 0.5 mg. and 1.0 mg. per kilogram of body weight.

E. R. SQUIBB & SONS

Ampuls Clorarsen: 45 mg. and 67 mg. Each ampul contains the stated quantity of dichlorophenarsine hydrochloride admixed with three and one half times its weight of a mixture containing sodium citrate 96 parts and sodium carbonate 4 parts.

Ampuls Clorarsen: 0.45 Gm. and 0.67 Gm. multiple dose containers. Each ampul contains the stated quantity of dichlorophenarsine hydrochloride admixed with three and one half times its weight of a mixture containing sodium citrate 96 parts and sodium carbonate 4 parts.

PHEMEROL CHLORIDE.—[p-(2-methyl-4,4-dimethyl pentano-2) (phenoxy-ethoxy-ethyl)] dimethyl benzyl ammonium chloride monohydrate.— $\text{C}_{22}\text{H}_{32}\text{O}_2 \cdot \text{NCl} \cdot \text{H}_2\text{O}$ M.W.466.09. Phemerol chloride has the following structural formula:



Actions and Uses.—Tincture Phemerol 1:500 and Solution Phemerol 1:1,000 (aqueous) are proposed as general purpose germicides and antiseptics.

Dosage.—Both the Tincture and the Solution are used full strength except in the nose and eye. For use in the nose and eye only the solution should be used, diluted with four parts of water.

Tests and Standards—

Phemerol chloride appears as colorless, odorless crystals possessing a very bitter taste. It may be recrystallized from a chloroform solution, by the addition of ether, in the form of very thin plates, which may assume a hexagonal shape. These crystals possess a high birefringence, parallel extinction and positive elongation and are biaxial with refractive indexes of 1.580 and 1.560. These crystals and the original material sinter slightly on the hot stage at 120 C. and melt at 164-166 C. The *pH* of a 1 per cent solution of phemerol chloride is between 4.8 and 5.5.

Mineral acids and many salt solutions precipitate phemerol chloride from solution, more concentrated than 2 per cent, as an oil which crystallizes on drying and has the same properties as phemerol chloride. A solution of phemerol chloride yields a flocculent white precipitate with soap solutions. To 1 cc. of a 1 per cent solution of phemerol chloride add 2 cc. of ethanol, 0.5 cc. of dilute nitric acid and 1 cc. of silver nitrate solution; a flocculent white precipitate appears, which is insoluble in dilute nitric acid but soluble in dilute ammonia water.

Dissolve 0.1 Gm. of phemerol chloride in 1 cc. of sulfuric acid, add 0.1 Gm. of sodium nitrate and heat on the steam bath for three minutes. Dilute the solution to 10 cc., add 0.5 Gm. of granulated zinc and warm for ten minutes. Cool, add 0.2 Gm. of sodium nitrite to 1 cc. of the clear liquid and add this mixture to 0.02 Gm. of G salt (sodium 2-naphthol 6,8 disulfonate) in 1 cc. of ammonium hydroxide; the solution turns orange red and a brown precipitate may appear.

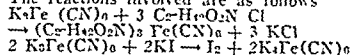
Transfer approximately 1 Gm. of phemerol chloride, accurately weighed, to a tared platinum dish and dry in an oven at 100 C. to constant weight; the loss in weight is not less than 3.5 nor more than 4.2 per cent. Ignite the residue; the weight of ash is not more than 0.1 per cent.

Transfer approximately 2 Gm. of phemerol chloride, accurately weighed, to a 100 cc. flask, dissolve in 30 cc. of water; add 10 cc. of nitric acid and 50 cc. of tenth normal silver nitrate, dilute to the mark, mix well and filter through a dry paper. To 25 cc. of the filtrate add 1 cc. of 10 per cent ferric ammonium sulfate and titrate with tenth normal ammonium thiocyanate; the chloride content is not less than 7.6 nor more than 8.0 per cent, calculated to the dried substance.

Transfer an accurately weighed sample of phemerol chloride to a Kjeldahl flask and digest with sulfuric acid in the presence of selenium, cool, dilute with water, make alkaline with sodium hydroxide, distill the ammonia into the standard acid solution and titrate the excess acid; the nitrogen content is not less than 2.6 nor more than 3.1 per cent.

Dissolve approximately 5 Gm. of phemerol chloride, accurately weighed, in water to make 100 cc. of solution. Transfer exactly 5 cc. of this solution to a 100 cc. flask, add 5 cc. of buffer solution (260 Gm. of sodium acetate and 250 cc. of 36 per cent acetic acid mixed with water to make 1 liter) and 50 cc. of 0.00667 molar potassium ferrioxalate (prepared by dissolving 2.1948 Gm. of potassium ferrioxalate in water to make 1 liter and standardized against 0.01 normal sodium thiosulfate). After mixing well, allow the mixture to stand for one hour and filter through dry No. 1 Whatman paper. Discard the first 20 cc. and to the next 50 cc., accurately measured, add 5 cc. of 10 per cent potassium iodide solution and 5 cc. of diluted hydrochloric acid. After one minute add 10 cc. of 10 per cent zinc sulfate solution and titrate with 0.01 normal sodium thiosulfate, using starch as an indicator; the percentage of phemerol chloride calculated as the monohydrate is not less than 97 per cent nor more than 103 per cent of the original substance. The percentage of phemerol chloride monohydrate = $\left[\left(\text{cc. of } 0.00667 \text{ M } \text{K}_2\text{Fe}(\text{CN})_6 \right) - \frac{3}{2} \times \text{cc. of } 0.01 \text{ N Na}_2\text{S}_2\text{O}_3 \right] \times \left[\frac{9.326}{40} \times \frac{1}{\text{wt. of sample}} \right]$.

The reactions involved are as follows



PARKE, DAVIS & COMPANY

Tincture Phemerol 1:500 and Solution Phemerol 1:1,000: 30 cc., 120 cc., 480 cc. and 3,840 cc. bottles

U. S. Patent 2,115,250 (expires April 26, 1955) U. S. trademark 305,545

MENADIONE (See New and Nonofficial Remedies, 1944, p. 638).

The following dosage form has been accepted:

MEAD JOHNSON & CO., EVANSVILLE, IND.

Capsules Menadione: 1 mg

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO 10, ILL.

Cable Address - - - "Medic, Chicago"

Subscription price - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, SEPTEMBER 16, 1944

THE HISTORY OF PENICILLIN

Recently the *British Medical Journal* said editorially¹ that the history of penicillin is essentially the story of three distinct developments: "The first was Fleming's discovery;² the second was the victory of Florey and his colleagues, who showed how to obtain penicillin in a relatively pure form and who demonstrated its clinical use";³ the third "victory," the editor generously points out, lies in the American success in large scale production of the drug. Sir Howard Florey⁴ in the same issue of the *British Medical Journal* gives a detailed survey of the development of penicillin studies. He mentions that in 1877, prior to Fleming's disclosure, Pasteur and Joubert⁵ had observed that cultures of anthrax ceased to grow when contaminated with air bacteria; this, Florey believes, was the first evidence that a substance produced by one organism is capable of arresting the growth of another. In the years that followed, many other "antibiotics" were discovered; one, an extract from *Bacillus pyocyaneus*, was placed on sale in Germany in 1930 as an unguent for local application to the skin lesions arising from anthrax.⁶

After noting conspicuous inhibition of growth in a colony of *staphylococcus* contaminated by mold, Fleming subcultured the mold in broth and found that a strong antibiotic, nontoxic to animals, passed into the broth from the mold;² the mold was later identified by Thom in this country as *Penicillium notatum*, and Fleming designated the antibiotic agent "penicillin." He found that penicillin inhibited the test tube growth of many gram positive bacteria known to be highly pathogenic to man; he also noticed that his penicillin-containing broth did not disturb white blood cells; on applying the solution to several clinical cases of local skin infection he reported⁴ that the results "appeared to be superior to dressings containing potent chemicals."

Several years later Clutterbuck, Lovell and Raistrick,⁷ stimulated by Fleming's study, attempted to extract penicillin, but their efforts were largely unsuccessful; they concluded that the penicillin was too "labile" to be of clinical use. In this conclusion Sir Alexander Fleming reluctantly concurred. If one may judge by his published work, Fleming then abandoned further study of the agent until 1941,⁸ except as he used it for differential culture.⁹

The successful isolation of penicillin, the clearest proof of its clinical usefulness, its assay and dosage, as well as the mode of its excretion from the body are credited to Howard Florey and his resourceful associates at Oxford. In 1929, the year of Fleming's first paper, Florey began work on lysozyme,¹⁰ an antibiotic discovered by Fleming in 1922 and ultimately crystallized by Roberts in 1937.¹¹ During the next ten years Florey continued his study of various antibiotics, firm in the conviction that one nontoxic to human beings would be found which would be of value in treating human infections. The discovery of the clinical effectiveness of penicillin was thus an outcome of a broadly conceived program of study and not an advance immediately associated with the war. Ultimately the war immeasurably expedited the development of penicillin, but during the early stages of the work wartime restrictions considerably impeded the study; for, once it had been disclosed how penicillin might be successfully extracted, it proved impossible in England (in 1940) to initiate large scale production.

Florey first directed his attention to penicillin in 1938, when he was joined by an able continental biochemist, Dr. E. Chain; between them a plan was laid for a systematic study of penicillin and other naturally occurring antibacterial agents. Drs. Florey and Chain were presently joined by Drs. E. P. Abraham, A. D. Gardner, Norman G. Heatley, M. A. Jennings, J. Orr-Ewing, A. G. Sanders, C. M. Fletcher and also by Lady Florey, a physician of competence who has been largely responsible for studying the effectiveness of penicillin applied to locally infected areas. The ultimate success of the research largely depended on the development of a reliable procedure for assay. The test adopted was worked out by the microchemist of the team, Dr. Norman Heatley, and consisted in determination of the rate of inhibition of growth of a standard bacterial culture. Through the use of an ingenious extraction method involving the passing of impure acid penicillin broth from a watery solution into an organic solvent (ether or amyl acetate) and the subsequent passing of the purified agent again into water (shaken with alkali), they obtained sufficient penicillin for clinical trial. The

7. *Biochem. J.* 26: 1907 (Nov.) 1932.

8. *Nature*, London 148: 757, 1941.

9. Fleming writes "I have used penicillin constantly since 1929 for differential culture but its use for practical therapeutic purposes remained in abeyance until the Oxford workers started their investigation" (*P.*

M. Bull. 2: 5 [Jan.] 1944).

10. *Brit. J. Exper. Path.* 11: 251 (Aug.) 1930.

11. *Quart. J. Exper. Physiol.* 27: 89, 1937.

1. *Brit. M. J.* 2: 186 (Aug. 5) 1944; *Brit. M. Bull.* 2: 4 (Jan.) 1944.

2. *Brit. J. Exper. Path.* 10: 226 (June) 1929.

3. *Lancet*, 2: 226 (Aug. 24) 1940.

4. *Brit. M. J.* 2: 169 (Aug. 5) 1944.

5. *Compt. rend. Acad. d. Sc.* 85: 101, 1877.

6. *Ztschr. f. Hyg. u. Infektionskr.* 31: 1, 1899.

first patient was treated on Feb. 12, 1941; the response was dramatic, but the supply of penicillin ran out and shortly thereafter the patient had a relapse and died. As might have been expected, the Oxford team encountered difficulty in obtaining suitable cases for clinical trial, and patients eventually turned over to them were generally moribund with advanced septicemia. By June 1941 6 such patients had been treated intravenously; all had responded, but 2 had died when the penicillin supply became exhausted.¹²

Undeterred by difficulties and an apathy that would have caused many to abandon the work until after the war, Florey, accompanied by Dr. Heatley, came to this country in July 1941 under the auspices of the Rockefeller Foundation, requesting that the National Research Council in Washington lend a hand in the medical study of penicillin, and more particularly in the attack on the problem of production. Through the foresight of Ross G. Harrison, chairman of the National Research Council, Florey was put in touch at once with the fungus laboratories of the Department of Agriculture, and through the cooperation of Dr. Coghill, director of the Fermentation Division of the Department of Agriculture's research laboratory at Peoria, new methods were worked out for increasing yield; within a few months large scale production of penicillin was begun by a group of enterprising American drug houses. The earliest patient to be studied in this country under the auspices of the Office of Scientific Research and Development was first treated with penicillin on March 14, 1942 in New Haven, Conn., an advanced case of hemolytic streptococcus septicemia, which responded most dramatically to the drug.¹³

Dr. Florey had returned to England in September 1941. Dr. Heatley remained in this country for some twelve months to assist in the negotiations for the large scale production of the drug; during this time Heatley rendered invaluable assistance in supervising assay of the early yields. Professor Florey devoted the following year (1942) to studying ways of purifying penicillin and, in association with Lady Florey, conducted a highly significant investigation on local application of penicillin; since supplies were still low there was too little available for general administration.¹⁴ In the summer of 1943 Florey and Brigadier Hugh Cairns, consulting neurosurgeon to the Royal Army Medical Corps, were sent to North Africa by the British War Office to study the uses of penicillin in war wounds. They returned three months later with a radical report which insisted¹⁵ that open flesh wounds and wounds of the head can be safely and tightly closed if dealt with early, provided penicillin solution is admin-

istered locally in the wound after thorough débridement. Their initial experience has been strongly vindicated during the past year by other British medical officers as well as by medical officers of our own Army and Navy. To quote a conservative report,¹⁶ "The percentage of scalp and brain wounds that heal by primary union has always been a high one when operation is performed at special neurosurgical units. In Italy, with greater infectivity of the terrain, this standard tended to deteriorate whenever penicillin was in short supply but was maintained when penicillin-sulfathiazole powder was insufflated to surface wounds and into depths of brain." Less conservative, but not less significant, is Florey and Cairns' original statement¹⁵ that of 171 recent (three to twelve days) soft tissue wounds 104 closed by primary union, 60 closed with some degree of granulation and 7 were classified as failures. "None of the patients," they add, "in this series has been placed in danger [i. e. there were no fatalities]. This is a remarkable fact when we consider that the wounds closed included large and purulent wounds of the worst type—for example, large buttock wounds infected with hemolytic streptococci and clostridia. Only once was it necessary to release the stitches; this was in a penetrating chest wound and cellulitis of the chest wall. . . . Cases with complete union (104) call for no comment. In cases with subtotal union (60) the gaping area usually healed rapidly by granulation. The failures (7) occurred in the early stages of the investigation and could usually be attributed to errors in technique of skin closure and rarely to persistence of pyogenic cocci. These patients came to no harm, and the attempt at closure did not interfere with their healing by granulation." A wound which heals by primary intention requires three weeks; if granulation occurs, six to twelve weeks may elapse. The military significance of this is too obvious to require comment. Indeed, many have come to feel that penicillin will transform our entire concept of management of wartime injuries, and it will no doubt have a similarly far reaching effect on civilian traumatic surgery.

Sir Howard Florey had scarcely returned from North Africa when he was summoned early in 1944 to Moscow, where he was able to give our Soviet allies first hand information concerning penicillin, particularly with regard to local administration in war wounds; on his return from the Soviet Union, Australia, the country of his birth, requested his counsel.

The *British Medical Journal* gives deserved and generous credit to Dr. A. N. Richards, chairman of the Committee on Medical Research, and to the Office of Scientific Research and Development for sponsoring the medical aspects of the penicillin program in this country. One can only add that part of Dr. Richards' wise direction of the program lay in his fortunate selection of the Division of Medical Sciences of the National Research Council working through the Committee on

12. *Lancet* 2: 177 (Aug. 16) 1941.

13. Tr. A. Am. Physicians, to be published; *Yale J. Biol. & Med.* 15: 507 (Jan.) 1943.

14. *Lancet* 1: 387 (March 27) 1943.

15. Florey, H. W., and Cairns, Hugh: A Preliminary Report to the War Office and the Medical Research Council on Investigation Concerning Use of Penicillin in War Wounds [London], War Office (A. M. D. 7), October 1943.

16. *Brit. M. J.* 2: 1 (July 1) 1944.

Chemotherapeutic and Other Agents with its succession of able chairmen (Col. Perrin Long until July 1942 and thereafter Dr. Chester S. Keefer) as the official body responsible for supervising and directing both the formidable production schedule and the various research projects, two of the most significant of which were reported upon in last week's number of *THE JOURNAL*. The story of penicillin will long exemplify the highest traditions of medical research and, incidentally, the rich fruits of a sound international cooperation in wartime.

THIOUREA AND THIOURACIL IN TREATMENT OF THYROTOXICOSIS

After a study of the life cycle of persons with thyrotoxicosis, Fitz¹ concluded that the operative treatment of toxic goiter is generally successful but that the ultimate result is uncertain. The removal of the thyroid interrupts a vicious circle but does not reach the fundamental cause of the disorder; thus it is not a curative procedure. Two complications following operation are so frequently encountered as to be a definite hazard—the development of hypothyroidism or of recurrences.

The recent discoveries reported by the MacKenzies and McCollum² and Astwood³ point to the inhibition of function in an endocrine gland by the administration of certain chemical compounds. The MacKenzies, while investigating the possibility that sulfaguanidine, when fed to rats on a purified diet containing synthetic B vitamins, might prevent the synthesis of additional essential nutrients by the intestinal flora, observed that animals which received the drug for periods varying from six weeks to sixteen weeks showed without exception hypertrophy and hyperemia of their thyroid glands. The glands were from three to eight times larger than those of control animals which received the same diet without sulfaguanidine. The thyroid hypertrophy was accompanied by a definite fall in the basal metabolic rate. Both these changes were prevented or cured by administration of thyroxin but not by increasing the iodine content of the diet. At about the same time Richter and Clisby observed enlargement of the thyroid associated with loss of weight and other toxic reactions in rats fed phenyl thiourea in their drinking water. Accompanying this increase in weight of the thyroid, microscopic changes characterized by the continued heightening of the acinar epithelium and its encroachment on the concomitantly diminishing and vacuolated colloid were observed. The basal metabolic rate in adult rats which received sulfaguanidine for five to seven days dropped 10 per cent;

by the tenth to the fourteenth day it was —20 per cent, a level which was maintained to the end of the experiment at forty days. Addition of vitamin C and para-aminobenzoic acid enhanced the thyroid effect of sulfaguanidine. The addition of sodium iodide did not interfere with the thyroid effect of sulfaguanidine. In contrast with the foregoing results desiccated thyroid and thyroxin, when added to the diet, entirely prevented the thyroid enlargement and the microscopic changes. Kennedy found that oral administration of allyl thiourea to rats produced not only thyroid hyperplasia but an alteration of the cellular pattern of the anterior pituitary as well. Gersh and his associates established that the presence of the hypophysis is essential for the production of thyroid hyperplasia and hypertrophy by sulfaguanidine. They concluded that the sulfonamides and thioureas probably exert a depressing influence primarily on the functional activity of the thyroid and hence on the basal metabolic rate, and that thyroid hyperplasia is a reflection of increased pituitary activity resulting from the depression of thyroid function.

Astwood³ repeated these experiments and found that the hypertrophied glands rapidly regressed toward a normal condition on the cessation of treatment. Vascularity quickly decreased, the epithelium became flattened, colloid accumulated, and the size of individual follicles and the total size of the glands decreased. These retrogressive changes occurred fully as rapidly as the hyperplasia. Astwood likewise found that hypophysectomized rats did not develop thyroid hyperplasia on a 2 per cent sulfaguanidine diet. In spite of the histologic picture of overactivity, these animals did not present signs of hyperthyroidism; in fact, after a variable period of time the animals whose thyroids were hyperplastic began to exhibit distinct signs of hypothyroidism; that is, subnormal growth and development, lessened food intake and lowered basal oxygen consumption. The coexistence of thyroid hyperplasia and a lowered rate of metabolism suggested that the drug either exerted an action which inhibited the normal effect of the thyroid hormone on tissues in general or else that it interfered in some way with the adequate production of normal thyroid hormone. In either case the goiter would be the result of a compensatory hyperplasia which could not completely make up for the induced deficit. The mechanism of the goitrogenic action of these substances apparently resides in an interference with the synthesis of the thyroid hormone. The mode of action of these drugs, according to Astwood, appears to be an interference with the enzymatic synthesis of thyroid hormone. The exact site of block is still not known, but it is definitely established that the thyroid is rendered incapable of utilizing iodine for these processes. The resultant thyroid insufficiency leads via anterior pituitary stimulation to an ineffectual hyperplasia of the thyroid acinar cells. C.

1. Fitz, Reginald. A Panoramic View of Thyrotoxicosis, *J. A. M. A.* 125: 943 (Aug. 5) 1944; A Panoramic View of Thyrotoxicosis, *ibid.* 125: 1026 (Aug. 12) 1944.

2. MacKenzie, Julia B.; MacKenzie, C. G., and McCollum, E. V.: The Effect of Sulfanilylguanidine on the Thyroid of the Rat, *Science* 91: 518 (Nov. 28) 1941. MacKenzie, C. G., and MacKenzie, Julia B.: Effect of Sulfonamides and Thioureas on the Thyroid Gland and Basal Metabolism, *Endocrinology* 32: 185 (Feb.) 1943.

3. Astwood, E. B.; Sullivan, J., Insell, Adele, and Tjlowitz, R.: Action of Certain Sulfonamides and of Thioureas on the Function of the Thyroid Gland of the Rat, *Endocrinology* 32: 210 (Feb.) 1943.

more than a hundred compounds investigated by Astwood⁴ 2-thiourea was found to be the most highly active. The minimal lethal dose of this substance for rats was more than a hundred times the dose necessary to produce a detectable thyroid effect. Thiourea and thiouracil appear to be the most promising. There appears to be a variable latent period following the initiation of treatment before the metabolic rate begins to fall and a similar though somewhat shorter period before clinical improvement is subjectively and objectively apparent.

Astwood⁵ administered to 3 patients with thyrotoxicosis thiourea in doses of 1 to 2 Gm. per day or of thiouracil in doses of 0.2 to 1 Gm. with a resulting relief of symptoms and a return to normal of serum cholesterol and the basal metabolic rate. A latent period of one to two weeks occurred before a sustained improvement during treatment and a return of hyperthyroidism when therapy was discontinued. One of the patients developed agranulocytosis on the thirty-seventh day of therapy but recovered in seven days on withdrawal of the drug. Himsworth⁶ administered thiourea or thiouracil to 6 patients with thyrotoxicosis, and the results were as striking as those of Astwood. He did not observe any toxic effects of the drug. Williams and Bissell⁷ found that thiouracil is rapidly absorbed and is rapidly excreted. They treated 9 thyrotoxic patients with thiouracil and noted clinical improvement, which continued until all the symptoms disappeared within four to seven weeks. The basal metabolic rate fell progressively downward. The enlargement of the thyroid associated with thiouracil treatment which occurred in 3 of their patients and the increase in the pathologic state of the eyes in 1 patient suggest that in human beings, as in animals, thiouracil leads to excess thyrotropic hormone activity. Rawson and his collaborators⁸ administered thiouracil to 19 patients with toxic diffuse goiter. They report lowering of the basal metabolic rate, relief of symptoms, increase of hyperplasia of the thyroid with loss of colloid and increase in vascularity and in some instances increased lymphoid hyperplasia. They have also noted a decreased avidity for iodine by the thyroid gland, as shown by greatly impaired correlation of radioactive (tracer) inorganic iodine, with increased elimination in the urine. Impairment in the physiologic activity in the thyroids of persons treated with the drug was seen when tested on patients with myxedema. In patients previously treated with iodine the thyroid effects were delayed. They

conclude that these facts are consistent with the theory that thiouracil acts by preventing or blocking the utilization of iodine in the synthesis of thyroid hormone within the thyroid gland. Apparently, under the influence of thiouracil new active thyroid hormone is produced. Cessation of active thyroid hormone production is believed to stimulate the thyrotropic activity of the pituitary, and this in turn causes further hyperplasia of the thyroid, which however does not overcome the thiouracil block to active thyroid hormone production. Paschkis and his collaborators⁹ treated 21 cases of thyrotoxicosis with thiourea or thiouracil. Improvement was usually noticed after four to six days of treatment, with complete suppression of thyrotoxic manifestations after two to three weeks. One gram of thiouracil was effective in most cases. The drug proved particularly valuable in cases in which operation was deemed inadvisable. An attempt was made to establish a permanent dosage level rather than to employ intermittent treatment. After full effect was achieved, doses as small as 0.1 to 0.2 Gm. proved satisfactory. Myxedema developed in 2 cases and subsided after the drug was temporarily discontinued. Toxic manifestations from thiouracil consisting of skin eruptions, fever, arthralgia, leukopenia and jaundice were observed in 3 cases.

Gabrilovè and Kert¹⁰ treated 9 patients, 3 of whom developed toxic effects. One patient developed fever, general lymphadenopathy and skin eruption. Another patient presented fever and skin eruption, while the third patient showed moderate leukopenia. St. Johnston¹¹ administered thiourea for thyrotoxicosis to 3 patients and reports that all 3 developed toxic symptoms which were strikingly similar. The symptoms consisted of pyrexia from 101 to 104 F., occurring eight to ten days after administration of the drug, mild leukopenia with monocytosis, and a maculopapular eruption.

Elsewhere in this issue (page 153) Reveno reports 9 cases of toxic adenoma treated with thiouracil. Six showed a satisfactory response, while 3 were failures. One of the latter patients had diabetes and had been taking iodine for six years. The second responded favorably at first but developed a hemorrhage into the gland and thyroidectomy was done. The third was a patient who, while showing some clinical improvement, failed to show a drop in basal metabolic rate during the short period under observation.

Whether or not thiouracil will prove to be a satisfactory substitute for surgical treatment of toxic goiter cannot be stated on the basis of present limited experience. The drug promises to be of great value in cases in which operation is inadvisable or contraindicated.

4. Astwood, E. B.: The Chemical Nature of Compounds Which Inhibit the Function of the Thyroid Gland, *J. Pharmacol. & Exper. Therap.* 78: 79 (May) 1943.

5. Astwood, E. B.: Treatment of Hyperthyroidism with Thiourea and Thiouracil, *J. A. M. A.* 122: 78 (May 8) 1943.

6. Himsworth, H. P.: Thyrotoxicosis Treated with Thiourea, *Lancet* 2: 465 (Oct. 16) 1943.

7. Williams, Robert H., and Bissell, Grosvenor W.: Thiouracil in the Treatment of Thyrotoxicosis, *New England J. Med.* 229: 97 (July 15) 1943.

8. Rawson, Rulon W.; Evans, R. D.; Means, J. H.; Peacock, W. C.; Lerman, J., and Cortell, R. E.: The Action of Thiouracil on the Thyroid Gland in Graves' Disease, *J. Clin. Endocrinol.* 4: 1 (Jan.) 1944.

9. Paschkis, K. E.; Cantarow, A.; Rakoff, A. E.; Walking, A. A., and Tourish, W. J.: Thiourea and Thiouracil in Treatment of Thyrotoxicosis, *J. Clin. Endocrinol.* 4: 179 (May) 1944.

10. Gabrielovè, J. L., and Kert, M. J.: Sensitivity to Thiouracil, *J. A. M. A.* 124: 504 (Feb. 19) 1944.

11. St. Johnston, C. R.: Toxic Reaction to Thiourea: Report on 3 Cases, *Lancet* 2: 42 (July 8) 1944.

Current Comment

NEUROFIBROMATOSIS AND OSTEITIS FIBROSA CYSTICA

An extensive study and reevaluation of the apparent relations of neurofibromatosis (von Recklinghausen) and osteitis fibrosa cystica has been presented recently by Thannhauser.¹ On the basis of reports of simultaneous occurrence of nodular cutaneous neurofibroma, pigmented areas of the skin and osteitis fibrosa cystica in a single patient, a coherence of neurofibromatosis and osteitis fibrosa cystica is suggested, since the occurrence of these symptoms of two rare diseases in one person is not likely to be mere coincidence, Thannhauser says. Fibrocystic involvement of localized areas of the skeleton, especially the long bones, occurs in neurofibromatosis together with café au lait spots and cutaneous neurofibromas. Although microscopic examination of the osseous fibroma does not reveal nerve structures within the fibroma, whorls of spindle cells are occasionally found and may be considered to reflect its neurofibromatous origin. Thannhauser believes that hyperpigmented areas are the expression of underlying neurofibromatosis even without the appearance of neurofibromatous nodules. The presence of similar endocrine symptoms, especially the concurrence of precocious puberty and pigmented blotches of the skin in neurofibromatosis and also in osteitis fibrosa cystica disseminata offers additional corroboration of the belief that the two disturbances are related. The implication is strong that the anatomic structures which underlie the endocrine symptoms in cases of simple neurofibromatosis are the same as those of osteitis fibrosa cystica disseminata.

SYNTHESES IN THE INTESTINE

The first demonstrations of vitamin K deficiencies were made with chicks as experimental animals. In this species the failure to produce prothrombin through lack of vitamin K can be brought about by dietary adjustment alone. Later similar experiments were carried out with canaries, pigeons and ducks. Ordinary laboratory mammals—dogs, mice, rats—do not readily show a reduction in prothrombin level in the blood when restricted to experimental rations lacking vitamin K. However, if sulfanilylguanidine and succinylsulfathiazole are added to these diets, hemorrhages can be produced in rats.¹ In a recent study Daft and his co-workers² have extended the list of sulfonamides used and have shown that when the hemorrhages occur there appears also a severe hypoprothrombinemia. At a level of 1 per cent in the diet sulfapyrazine, sulfadiazine and sulfathiazole were much more effective in this respect than were sulfaguanidine, sulfanilamide and succinylsulfathiazole. The fact that the order of effectiveness of the sulfonamide drugs in producing the vitamin K deficiency is much like that observed in their bacterio-

static action on *Escherichia coli*, together with the observation that this group of organisms is particularly active in the synthesis of vitamin K, emphasizes anew the point of view that various types of intestinal bacteria exert a beneficent influence. The synthesis of vitamin of the B complex group, early reported in experimental animals, was recently³ cited again as a contributing factor in human nutrition, and attention has been called to the possibility of amino acid production by these organisms.⁴ Further investigation will doubtless reveal other ways in which this symbiotic activity in the intestine is of value to the host.

DIET AS PREDISPOSING FACTOR IN RHEUMATIC FEVER

In a recent report by Peete¹ observations are summarized on patients seen in clinic and private practice over a four year period who showed any signs of rheumatic fever or rheumatic heart disease. The patients were given a list of foods with instructions to check after each meal all the foods eaten and to write in any additional ones taken which did not appear on the list. The survey included a comparison of the dietetic habits of 50 patients, some with acute and some in the chronic state of rheumatic fever, as compared with 25 normal school children. A comparative study showed that the average diet of the rheumatic patient was low in those foods which supply vitamins A and D and minerals, especially calcium, phosphorus and iron. Some deficiency in proteins and an excessive intake in starchy foods and refined sugars also was apparent. The diets of both groups showed a restricted use of eggs. It was significant, Peete believed, that the average number in families of 75 rheumatic patients was 7.5 members per family, whereas the average in the control group of better economic status was 4.5. Among the conclusions of this study were that the incidence of acute rheumatic fever and rheumatic heart disease increases as exposure to the sun decreases; few recurrences of active infection developed when families cooperated satisfactorily in the correction of the deficient diet and in addition of cod liver oil to these diets; poor dietary habits were found among those even with adequate financial means. Finally, this investigator felt that the deficiency leading to the development of rheumatic infection closely follows the incidence of clinical rickets and that it alters immunity to the infective organism that produces the clinical picture of acute rheumatic fever. He emphasizes the importance of adequate amounts of vitamins A and D, milk, protein and sun bathing in the prophylaxis and prevention of recurrences of this disease. The conclusions expressed should be accepted with reserve. The genesis of rheumatic fever has not yet been explained: most features of the disease would appear to label it as due to a specific agent not yet identified, although numerous precipitating or predisposing factors presumably occur, among which diet may be included.

1. Thannhauser, S. J.: Neurofibromatosis (von Recklinghausen) and Osteitis Fibrosa Cystica Localisata et Disseminata (von Recklinghausen), *Medicine* 23: 105 (May) 1944.

1. Daft, F. S.; Ashburn, L. L., and Sebrell, W. H.: *Science* 96: 321 (Oct. 2) 1942.

2. Kornberg, A.; Daft, F. S., and Sebrell, W. H.: *Pub. Health Rep.* 59: 832 (June) 1944.

3. Najjar, V. A., and Holt, L. E., Jr.: The Biosynthesis of Vitamin K in Man, *J. A. M. A.* 122: 683 (Nov. 13) 1943.

4. Martin, G. J.: *Proc. Soc. Exper. Biol. & Med.* 55: 182 (Mar.) 1944.

1. Peete, Don Carlos: Rheumatic Fever: Diet as a Predisposing Factor, *Ann. Int. Med.* 21: 44 (July) 1944.

MEDICINE AND THE WAR

ARMY

REORGANIZE AIR SURGEON'S OFFICE

The War Department recently announced the partial reorganization of the Air Surgeon's office and reassignment of key officers of the Medical Service, Army Air Force. Brig. Gen. Charles R. Glenn, surgeon of the Army Air Force Training Command, was assigned deputy air surgeon on the staff of Major Gen. David N. W. Grant, the Air Surgeon, effective August 15. He succeeded Col. Walter S. Jensen, who has been assigned to an important post overseas. Other new assignments include those of Col. Henry C. Chenault, executive officer, who has been named director of professional services, Col. Oliver K. Niess, base surgeon and commanding officer of the Regional State Hospital, Mitchel Field, N. Y., who has been named director of administration, and Col. Richard L. Meiling, who will act as special assistant to the Air Surgeon.

The reorganization places the Director of Administration over the Operations, Personnel and Supply Divisions, while the Director of Professional Services will supervise the Professional, Aviation Medicine, Convalescent Training, Research and Statistics Division. Two divisions have received new designations. The Medical Services Division will be called the Professional Division, and the former Professional Division will be known as the Aviation Medicine Division.

The status of the division chiefs remains unchanged. The chiefs are Col. George L. Ball, Aviation Medicine Division; Col. Howard A. Rusk, Convalescent Training Division; Col. George F. Baier III, Operations Division; Col. E. L. Gann, Personnel Division; Col. William P. Holbrook, Professional Division; Col. Lloyd E. Griffiths, Research Division; Col. Joseph Berkson, Statistics Division; Col. Gustave E. Ledfors, Supply Division, and Major William H. Perkins, Office Services.

36TH GENERAL HOSPITAL UNIT COMMENDED

The 36th General Hospital unit, organized under the auspices of the Wayne University College of Medicine, Detroit, and staffed by Detroit and Michigan men and women, has been commended by the commanding officer of Headquarters Peninsular Base Section in Italy. The 36th General Hospital was stationed at Naples during the early months of the Italian campaign. The quarters it occupied, however, have now been returned to Italian civilians, and the unit, recently detached from the Peninsular Base Section, expects immediate assignment to another war area. Dr. Edgar H. Norris, dean of Wayne University College of Medicine, made this information public on receipt of a letter from Lieut. Col. Wyman C. C. Cole, formerly of Detroit, who is medical director of the 36th General Hospital. The commendation, dated August 16, came to Colonel Cole from Col. Richard T. Arnest, surgeon, Headquarters Peninsular Base Section, and read as follows:

"Upon the separation of your organization from the Peninsular Base Section I wish to express to you, your officers, nurses and enlisted personnel my sincere appreciation of the excellent performance of your various duties while assigned to this base.

"It has indeed been a pleasure to have your organization with this command and I regret your separation from the Peninsular Base Section. The professional ability and untiring devotion to duty of the members of your organization have done much to add to the comfort and well being of casualties admitted to your hospital. You should each be justly proud of a task well done."

The 36th General Hospital unit has been overseas for eighteen months. It was organized under the auspices of Wayne University College of Medicine by authority of the Secretary of War, and its roster includes 52 physicians, 105 nurses and about 500 enlisted personnel. Virtually all of these are from Detroit and Michigan.

REGISTRY OF VETERINARY PATHOLOGY ESTABLISHED

Recently an arrangement was approved by the Surgeon General of the U. S. Army and the board of governors of the American Veterinary Medical Association for the establishment and maintenance at the Army Institute of Pathology, Army Medical Museum, Washington, D. C., of a Registry of Veterinary Pathology. This registry will become a unit of the American Registry of Pathology, an organization operating by the authority of the Surgeon General under the sponsorship of the National Research Council. Material submitted should be addressed to Director, Army Institute of Pathology, Army Medical Museum (attention Registry of Veterinary Pathology), 7th and Independence Avenue S.W., Washington 25, D. C. The director will be glad to furnish further instructions to contributors for submission of material to the Registry of Veterinary Pathology. The members of the Special Committee on Registry of Veterinary Pathology are W. H. Feldman, Mayo Foundation, chairman; Capt. Charles L. Davis, V. C., Army Institute of Pathology; Harry W. Schoening, chief, Pathological Division, U. S. Bureau of Animal Industry, and, member ex officio, Lieut. Col. Balduin Lucké, M. C., deputy director, Army Institute of Pathology.

WHOLE BLOOD SHIPPED TO FRANCE

The first shipment of whole blood from the United States to soldiers wounded in France was made by the U. S. Army Medical Department by an army plane, August 21. Daily shipments have been made since, 250 pints a day the first week and 500 pints a day the second week; 750 pints a day will be shipped soon. Type O blood is being collected by the Red Cross for the shipments in response to appeals from Major Gen. Norman T. Kirk, Surgeon General of the Army, and Rear Admiral Ross T. McIntyre, Surgeon General of the Navy. The whole blood is prepared for shipment on the day it is drawn, and twenty-one hours after it leaves the United States it is available for transfusion in France. Brig. Gen. F. W. Rankin and Col. B. N. Carter of the Surgical Consultant Division with Lieut. Col. Douglas B. Kendrick, consultant to the Surgeon General on transfusions and plasma, developed the program for the Army Medical Department, and new developments in the preservation and refrigeration of whole blood were worked out to make the plan effective.

ARMY AWARDS AND COMMENDATIONS

Major Henry T. Earhart

The Bronze Star Medal was recently awarded to Major Henry T. Earhart, formerly of Mulberry, Ind. The citation accompanying the award read "At Hollandia, Dutch New Guinea, from April 26 to May 18, 1944 he was outstanding in performance of duty in a place of great responsibility as surgeon of a signal battalion. By his conspicuous efficiency above and beyond the regular call of duty he rendered invaluable service in the handling of the sick, injured and wounded men from a command of over 600 men, with a very limited number of Medical Department personnel." Dr. Earhart graduated from Indiana University School of Medicine, Indianapolis, in 1939 and entered the service March 21, 1941.

Colonel Edgar C. Jones

The Legion of Merit Award was recently presented to Col. Edgar C. Jones, McConnelville, Ohio, for "service as assistant surgeon, Fifth Corps Area, surgeon, Fifth Corps Area, and later as chief of the Medical Branch and Surgeon Fifth Service

Command, during a period of expansion and reorganization from Oct. 22, 1940 to June 30, 1944. In the performance of his duties he displayed in the highest degree the qualities of intelligence, loyalty, devotion to duty, sound judgment and a thorough understanding of his mission. His contribution to the war effort has been a most effective one, rendered always with a most unselfish devotion to the Nation's welfare." Dr. Jones graduated from Jefferson Medical College of Philadelphia in 1906. He was in the regular army of the United States until Oct. 31, 1938, when he retired and returned to active duty Oct. 21, 1940.

Captain Emile G. Schuster

The Distinguished Service Cross was recently awarded to Capt. Emile G. Schuster, formerly of Oakland, Calif. The citation accompanying the award read "During the capture and defense of hill positions of Mount Patano, Italy, from Nov. 29 to Dec. 3, 1943 he gave medical aid to the wounded while under mortar and artillery fire and at times under direct machine gun and rifle fire. On one occasion he advanced in front of forward position under fire to an enemy mine field and rendered his services to men wounded by antipersonnel mines. During daylight hours he administered plasma in the midst of enemy fire. On one occasion while performing this task the flask was shot from his hand and the tree beside him cut down by machine gun fire. However, he secured more supplies and calmly continued his treatment. His fearless actions under

enemy fire alleviated much suffering and saved many lives." Dr. Schuster graduated from McGill University Faculty of Medicine, Montreal, in 1940 and entered the service April 6, 1942.

Colonel Alfonso M. Libasci

The Legion of Merit Award was recently given to Col. Alfonso M. Libasci, formerly of Brooklyn, for his "resourcefulness, perseverance and ingenuity" in organizing and directing the medical supply system of the Army in the Southwest Pacific area. He was cited for his achievement in organizing a supply system by means of which medical goods were swiftly and automatically routed to combat areas. He was also credited with simplifying the accounting and requisitioning systems and with developing the portable surgical hospital unit, which saved many lives in the South Pacific island jungles. Dr. Libasci graduated from Long Island College of Medicine, Brooklyn, in 1931 and has been on active duty with the Army since 1933.

Colonel Ashley W. Oughterson

The Legion of Merit was recently awarded to Col. Ashley W. Oughterson, formerly associate professor of surgery at Yale University School of Medicine, New Haven, Conn., for "exceptionally meritorious conduct in the performance of outstanding services in the South Pacific area from Dec. 1, 1942 to June 13, 1944. Dr. Oughterson graduated from Harvard Medical School, Boston, in 1924 and entered the service in January 1942.

NAVY

NAVY AWARDS AND COMMENDATIONS

Lieutenant Samuel E. Elmore Jr.

The Silver Star Medal was recently awarded to Lieut. Samuel E. Elmore Jr., formerly of New Orleans. The citation accompanying the award read "For conspicuous gallantry and intrepidity while attached to the Third Marine Division during the landing attack at Cape Torokina, Solomon Islands, on Nov. 1, 1943. When the fighting was most desperate and many of our wounded were lying helpless within dangerous proximity to the enemy, Lieutenant Elmore unhesitatingly entered the area of the Japanese defensive position and gave expert medical attention to the injured despite an incessant rain of enemy fire. While engaged in this vital work, he was suddenly and viciously attacked by a Japanese soldier and, mindful of the need for uninterrupted medical care, engaged the enemy in hand to hand combat, killing him and thereby removing an imminent threat to the lives of the men who depended on his assistance. The professional skill and outstanding valor displayed by Lieutenant Elmore throughout this engagement inspired courage and confidence among the wounded and were in keeping with the highest traditions of the United States Naval Service." Dr. Elmore graduated from Harvard Medical School, Boston, in 1940 and entered the service in September 1942.

Commander James J. Sapero

The Distinguished Service Medal was recently presented to Comdr. James J. Sapero, now on temporary duty in the Bureau of Medicine and Surgery, Navy Department, Washington, D. C. The citation accompanying the award read "For exceptionally meritorious service to the government of the United States in a duty of great responsibility while serving as malaria and epidemic disease control officer on the staff of the commander, South Pacific Area and South Pacific Force, from Aug. 17, 1942 to Jan. 2, 1944. Displaying exceptional medical skill and distinctive leadership, Commander Sapero conceived and developed the malaria control unit in the area and, as a result of his untiring efforts and those of his organization, the incidence of malaria among the military and naval forces was drastically reduced. The excellent principles and methods established by Commander Sapero in the control of this disease prevented a tremendous loss of manpower and served as a guide for checking the epidemic in other military areas. His brilliant initiative and outstanding ability contributed materially

to the superb physical conditions and high morale of our fighting forces in this vital area." Dr. Sapero graduated from Stanford University School of Medicine, San Francisco, in 1932. He has been in the service since June 1931.

Lieutenant Arthur T. Willetts

Lieut. Arthur T. Willetts, formerly of Verona, Pa., was recently awarded the Silver Star Medal "for conspicuous gallantry and intrepidity as battalion surgeon attached to the Third Marine Division during the landing attack at Cape Torokina, Solomon Islands, on Nov. 1, 1943. On finding that perilous enemy fire was endangering the lives of our wounded men who had fallen on the beachhead, Lieutenant Willetts promptly requested a nearby assault unit to attack an adjacent enemy infested jungle area and, after the site was cleared of hostile troops, established an aid station in order to attend the injured men under cover of the jungle growth. Although his medical post was attacked by enemy machine guns six times during the day, he skilfully treated many serious wounds, consistently maintaining a calm courage which concealed from the patients under his care the danger of their situation. Lieutenant Willetts' professional ability and heroic devotion to duty were in keeping with the highest traditions of the United States Naval Service." Dr. Willetts graduated from the University of Pittsburgh School of Medicine in 1937 and entered the service March 9, 1942.

EXHIBIT OF NAVAL MEDICINE AT NATIONAL GALLERY OF ART

A collection of one hundred paintings and drawings of naval medicine were put on view at the National Gallery of Art, Washington, D. C., September 10, where it will remain until October 8, after which the collection will be sent on tour throughout the United States. The artists who participated in the program and the phases of naval medicine which they covered are as follows: Hospital Corps Training, depicted by David Stone Martin and Irwin Hoffman at the Navy Medical Field Service School, Camp Lejeune, North Carolina; Combat Action, depicted by Joseph Hirsch and Kerr Eby at Pearl Harbor, New Caledonia, New Guinea, Guadalcanal, Tarawa and Bougainville; and Treatment of Convalescents, depicted by Carlos Andreson and Julian Levy at the U. S. Naval Hospital, Portsmouth, Va., and National Naval Medical Center, Bethesda, Md.

MISCELLANEOUS

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

At Rhoads General Hospital, Utica, N. Y., in conjunction with the Oneida County Medical Society: War Wounds of the Extremities: Clinical Demonstration, Major Robert Perlman, October 10.

At Camp McCoy, Wisconsin: Symposium on Organic Neurology, Dr. T. C. Erickson, October 4; Dermatologic Diseases, Dr. G. A. Cooper, October 18.

At Truax Field, Wisconsin: Endocrinology, Dr. Elmer L. Sevringhaus, October 4; Virus and Rickettsial Diseases, Dr. Marcos Fernan-Nunez, October 18.

In Canada the Committee on Wartime Graduate Medical Meetings is cooperating in the presentation of the Dalhousie Refresher Course, Halifax, Nova Scotia, from October 9 to 13, by sending the following guest speakers, who besides conducting clinics will present two scientific papers: "Gout" and "Diagnosis of Adrenal Insufficiency," Dr. George W. Thorn; "Cancer of the Prostate" and "Sex Hormones in Clinical Practice," Dr. Charles Huggins; "Tuberculosis in Children" and "Blood Dyscrasias," Dr. Ralph Tyson; "The Recognition and Management of the Psychoneurotic Patient" and "Some Common Psychosomatic Disturbances and Their Treatment," Dr. Thomas A. C. Rennie.

AMERICAN PHARMACEUTICAL ASSOCIATION RECEIVES AWARD FOR QUININE POOL

The War Production Board recently awarded a scroll of appreciation to the American Pharmaceutical Association on behalf of the nation's pharmacists in contributing their quinine stocks to a national pool for the armed forces. In gratitude for the more than 152,000 ounces of cinchona products collected, the government officials expressed "thanks to the pharmacists of America whose contributions made a success of the quinine pool, to the Philadelphia College of Pharmacy and Science, which first inaugurated and proved the feasibility of the pool within the commonwealth of Pennsylvania, to the personnel of the Institute of Pharmacy and to the American Pharmaceutical Association, which assumed the burden of the nationwide effort and carried it through to a commendable conclusion."

The presentation was made at the American Institute of Pharmacy by two pharmacists of the War Production Board, Fred J. Stock, chief of the Drugs and Cosmetics Branch of the Chemicals Bureau, and Henry W. Heine, chief of the Botanicals and Imports Unit of the Drugs and Cosmetics Branch of the Chemicals Bureau. The pharmacists were co-signers of the scroll with Donald M. Nelson, chairman of the War Production Board.

NEW BRITAIN GENERAL HOSPITAL LENDS PATHOLOGIST TO U. S.

Dr. H. Weston Benjamin, managing director of New Britain General Hospital, New Britain, Conn., recently announced that the board of directors acceded to a request from the Office of Scientific Research and Development Committee on Medical Research for the services of Dr. Paul D. Rosahn, pathologist in charge of laboratories at the hospital. Dr. Rosahn will act as technical aide to the committee assigned to contracts in venereal disease under the direction of the deputy division chief in charge, Dr. Joseph Earle Moore of Johns Hopkins Hospital and University. His work is primarily the supervision of studies of the effect of penicillin in syphilis now in progress under the O. S. R. D. auspices at the request of the armed forces. He will also have certain other duties in connection with the contracts entered into between the Office of Scientific Research and Development Committee on Medical Research and various universities dealing with other research problems in the field of venereal disease. Dr. Rosahn will continue to be in charge of the laboratories at New Britain General Hospital but will spend part of each week in Baltimore, Washington,

New Britain and other cities where his duties associated with this new project may call him. During his absence from the hospital Dr. M. C. Winternitz, professor of pathology at Yale University, will work with Dr. Rosahn in supervising the pathologic and laboratory routines of the hospital.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in *THE JOURNAL*, September 9, page 109)

ALABAMA

Children's Hospital, Birmingham. Capacity, 50; admissions, 1,329. Mrs. Victoria K. Willman, R.N., Superintendent (resident—pediatrics).

CALIFORNIA

St. Luke's Hospital, San Francisco. Capacity, 225; admissions, 6,678. Dr. Howard H. Johnson, Medical Director (1 intern).

ILLINOIS

St. Joseph's Hospital, Joliet. Capacity, 334; admissions, 7,354. Sister M. Henrica, R.N., Superintendent (interns).

KENTUCKY

St. Elizabeth Hospital, Covington. Capacity, 367; admissions, 5,938. Sister M. Alacoque, Administrator (1 intern).
Louisville General Hospital, Louisville. Capacity, 587; admissions, 9,805. Dr. John Walker Moore, Medical Director (1 resident—medicine; 1 intern).

MARYLAND

Johns Hopkins Hospital, Baltimore. Capacity, 1,034; admissions, 17,699. Dr. Winford H. Smith, Medical Director (1 assistant resident, 1 resident—roentgenology).

MICHIGAN

Charles Godwin Jennings Hospital, Detroit. Capacity, 108; admissions, 2,304 (3 interns, Nov. 1, 1944; 3 interns, July 1, 1945).

MINNESOTA

St. Mary's Hospital, Duluth. Capacity, 320; admissions, 9,474. Sister M. Patricia, Superintendent (interns).
St. Mary's Hospital, Minneapolis. Capacity, 340; admissions, 10,702. Sister Conchessa, Superintendent (interns).
Bethesda Hospital, St. Paul. Capacity, 180; admissions, 6,083. Rev. L. B. Benson, Superintendent (interns).
St. Joseph's Hospital, St. Paul. Capacity, 308; admissions, 10,335. Sister M. Ignatius, R.N., Superintendent (interns).

OPEN PSYCHIATRIC REHABILITATION CLINIC AT MOUNT ZION HOSPITAL

A psychiatric rehabilitation clinic for the treatment of ex-servicemen and women discharged from the armed forces on account of neuropsychiatric disabilities has been established at the Mount Zion Hospital, San Francisco. The clinic will utilize both individual and group therapy and will be staffed by psychiatrists, internists, psychiatric social workers, vocational advisers and dietitians. It will be open both during the day and in the evening for the benefit of men and women who are employed in industry. A close contact will be maintained with the United States Army and Navy hospitals, the Red Cross, the United States War Manpower Commission, the State Bureau of Vocational Rehabilitation and the various social agencies of the city of San Francisco. The project was made possible by a grant from the Columbia Foundation of San Francisco. Dr. J. S. Kasanin is director of the clinic.

MERCY SHIPS

Three Netherlands liners, specially converted for the purpose, are being used as hospital ships to evacuate American wounded from the northern Netherlands New Guinea coast to base hospitals. The ships, whose white hulls have become familiar sights along the invasion beaches, are the *Maatsuycker*, the *Abel Tasman* and the *Jansen*.

ORGANIZATION SECTION

WASHINGTON LETTER

(From a Special Correspondent)

Sept. 11, 1944.

Hearings on Poliomyelitis

Use of the airplane to evacuate victims of infantile paralysis in sparsely settled states like Nevada and Wyoming is recommended by Dr. Frank R. Ober of Boston, professor of orthopedic surgery at Harvard Medical School. Dr. Ober told the Kelley committee investigating aid to the physically handicapped that excellent work is being done throughout the country in rehabilitation of patients with infantile paralysis. The war had created difficulty in getting orthopedic surgeons, but, when hostilities cease, surgeons now in the Army will be available to carry on the work more successfully, he said. Lack of publicity was one reason for failure of people to take full advantage of facilities now in existence for treatment of the disease. While expressing the view that adequate clinical facilities were now operating in such states as Massachusetts, New York and Pennsylvania, Dr. Ober admitted that sparsely settled sections are without adequate means for treatment of the disease. Asked if he thought regional clinics should be set up, he said "It seems to be that is the way to take care of it." In the early stages of poliomyelitis, Dr. Ober said, nursing is required to relieve the painful symptoms and to prevent deformities. After painful symptoms have disappeared, active methods must be applied toward restitution of the functions and improvement of muscles, which is done by physical therapy, under direction of a physician who understands the problems. Rehabilitation is complicated by the fact that treatment may be required indefinitely. Maximum recovery is within twelve to twenty-five months, yet he had seen recovery take place after thirty-five years. Dr. Ober described in detail the organizations that had been set up in Vermont and Massachusetts for the physically handicapped.

Other witnesses at the hearings on poliomyelitis were Dr. Charles Armstrong, chief of the Division of Infectious Disease, U. S. Public Health Service, Dr. A. L. Van Horn, director of the Division of Health Services, Children's Bureau, Department of Labor, and Dr. Don W. Gudakunst, medical director of the National Foundation for Infantile Paralysis.

Samuel Barker, general counsel for the committee headed by Augustine B. Kelley (Democrat, Pennsylvania) on the physically handicapped, said hearings would continue September 12 to 14 on problems of the deaf and hard of hearing.

\$10,000,000 Asked for Infantile Paralysis Study

A resolution authorizing the expenditure of \$10,000,000 for the study of the causes and cure of infantile paralysis has been proposed for immediate consideration by Senator Langer (Republican, North Dakota). Author of the measure, which he introduced because of the unusual prevalence of the disease in the Eastern states this year, particularly in the District of Columbia and nearby communities, Senator Langer stated that he would urge Senator Thomas (Democrat, Utah) to call a meeting of the Education and Labor Committee to get action if possible before the impending recess of Congress.

Wartime Health Program Hearings Resume

Health needs of veterans will be one of the subjects to be investigated when the second series of public hearings on the National Wartime Health Program resume September 18, 19 and 20, Senator Claude Pepper (Democrat, Florida) announced today. He is chairman of the Senate Special Subcommittee on Wartime Health and Education. Other topics to be taken up are the significance of the Selective Service physical examination data, methods of improving the distribution and quality of medical care, hospital planning and construction. "At the first series of hearings," said Senator Pepper, "the committee heard testimony of medical and dental experts of the Army, Navy, Selective Service System and U. S. Public Health Service. Startling data were disclosed relating to the tragic fact that

nearly 5,000,000 of the nation's young men have been found physically and mentally unfit for service in the armed forces of their country. Constructive proposals have been offered to improve the people's health so that in the future, whether in war or in peace, the nation will not be similarly handicapped."

Senator Pepper indicated that at the September 18-20 hearings representatives of the organized medical profession, industry and labor will testify. Witnesses will include Dr. Roger I. Lee, President-Elect, Dr. Harvey Stone and Dr. R. L. Sensenich of the American Medical Association; Dr. John P. Peters, secretary, Committee of Physicians for Improvement of Medical Care; Dr. E. I. Robinson, president, National Medical Association; Dr. Ernst P. Boas, chairman, Physicians Forum; Dr. John R. Boling, president, Florida State Medical Society; Dr. Victor Heiser, chief medical consultant, National Association of Manufacturers; Dr. Leverett D. Bristol, chairman, Health Advisory Council, U. S. Chamber of Commerce, and representatives of the American Federation of Labor and the Congress of Industrial Organizations. Mayor Fiorello H. LaGuardia will testify concerning the projected health insurance plan for New York City.

Venereal Disease Problem

A national conference on venereal disease control will be held in St. Louis, November 9 to 11, Dr. J. R. Heller Jr., chief of the Venereal Disease Division of the U. S. Public Health Service, has announced. "The war has brought large increases in venereal disease infections in many parts of the world," he said. "Simultaneously, however, science has produced new drugs, and medical research has produced new methods to combat syphilis and gonorrhea. A major purpose of the conference will be to consider how these new methods can be applied promptly on the large scale necessary to halt what might become a worldwide postwar venereal disease epidemic.

"The seriousness of the venereal disease problem throughout the world," he said, "is exemplified by reports indicating that infections are spreading even in the Scandinavian countries, which for many years have been almost free of venereal disease." Dr. Heller said that with millions of Americans returning from foreign lands, and an enormous expected increase in travel to and from the United States, effective venereal disease control will require international cooperation. The eighth postgraduate course in venereal disease control will be conducted at the Public Health Service Medical Center, Hot Springs, Ark., October 19 to November 8. The postgraduate training course will be given to health officers and to private physicians cooperating with state and local health department venereal disease control programs.

Dr. Heller, in a letter to venereal disease control workers, said that an enormous new venereal disease control responsibility will face state and local health departments throughout the country on demobilization. He said that a plan had been agreed on by the Surgeon General of the Army and the Surgeon General of the Public Health Service which would assure return of soldiers to civilian life practically free of infectious syphilis "and thus preclude the introduction of new chains of infections in home communities." The plan is already in operation at army separation centers and will be used when large scale demobilization begins.

Social Hygiene Instruction in Schools

A program of social hygiene instruction in public schools "to begin with the preschool child, continue throughout public school training and carry over into the education of adults, particularly parents," is recommended in a resolution of the board of managers of the National Congress of Parents and Teachers. Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, was advised that the congress supports the efforts of federal, state and local educational authorities to institute such a program. The congress believes that the program will help

in "providing adequate juvenile protection, preventing the spread of venereal infection and providing more adequate personal, family and community living."

Music as an Aid to Treatment

Music as an adjunct to medicine is being tried out at Walter Reed General Hospital here. The Surgeon General of the United States Army has authorized the Institute of Applied Music to conduct an experiment in developing the potentialities of music in relation to medicine. The institute, a group of professional musicians, was organized to work out the problem on patients to determine the effect of music on certain types of mental and nervous disorders. The group is engaged in the experiment under the guidance of Miss Frances Paperte, former member of the Chicago Opera Company and soloist with the New York Philharmonic and Cincinnati symphony orchestras. Participating musicians are working in close collaboration with army psychiatrists treating the patients. The institute plans to learn how the slightest gain, if any, is accomplished, to determine if it will work again and if it can be accepted as a rule. All music presented will be checked against a table of variables and applied in a predetermined manner, subject to the requirements of the doctor in charge. Probability curves have been charted, and these will be checked against actual results obtained. From this, greater refinements can be plotted, until cause and effect principles have been established.

"As in any scientifically controlled experiment," says Miss Paperte, "it is obvious that it must be proved beyond any doubt that the system followed is dependable. The work, of course, is too new to permit of conclusions. Various methods have been explored and at present it may be safe to say that indications are encouraging." She said that music as an aid to treatment has been tried before, but it has never been properly or adequately controlled, nor has its application been evaluated

scientifically. The music itself, presented by the highest type of professional musicians, is regarded solely as an aid to treatment and not, as popularly regarded, as merely an entertainment or recreational performance. Miss Paperte states that most people are unaware of the deep understanding required in considering the psychologic significance of music as utilized in the work. Dealing with the instinctive tendencies of human beings is a serious matter, with physical, psychologic and social values at stake, and these factors are too significant to allow of any but technically sound and objective handling.

FWA Grants Washington Hospitals \$4,100,000

The Federal Works Administration grant of \$4,100,000 to George Washington and Georgetown universities for two new 400 bed hospitals in the capital may obviate necessity for the proposed 1,500 bed medical center, according to Representative Thomas D'Alesandro Jr. (Democrat, Maryland). He expressed the hope that grants would also be made to Gallinger, Providence and Emergency hospitals. The FWA grants came as a result of congressional activity to increase Washington's badly needed hospital facilities. Construction is to start soon, and the two hospitals should be ready for occupancy in a year. Order for allocation of funds has been signed by President Roosevelt, and priorities have been approved. Georgetown University was granted \$1,400,000 for a building to be erected on a university owned site on Reservoir Road. The university will furnish \$600,000 in funds to replace its old buildings of 265 bed capacity, some 50 years old. George Washington University was granted \$2,700,000 for construction of a nine story building and purchase of a site near Washington Circle. The university will post \$350,000 for the project and pay the government money derived from sale of its present 92 bed building. Abandonment of the universities' present hospital buildings will mean a net gain of 443 new hospital beds for the District of Columbia.

MEDICAL ECONOMIC ABSTRACTS

THE MILWAUKEE MEDICAL SOCIETY EXPANDS PREPAYMENT PLAN

According to reports in the *Milwaukee Journal and Sentinel* the Milwaukee Medical Society has decided to expand a plan which it has had in operation for the last seven months for the 300 employees of one company into a general plan to be offered to all industrial organizations. Only surgical and obstetric care in a hospital will be covered.

The monthly rates charged are for the individual \$0.90, for husband and wife, including maternity, \$1.75, and for the complete family \$2.50. While it is expected that most enrolments will be through pay roll deductions, arrangements will be made for other groups where possible. The income limit for an individual is \$1,800 a year and for a family \$2,400, plus \$200 for each child under 18. For subscribers above this income the indemnity plan will be used with the physician entitled to make an additional charge if desirable.

CHANGES IN NEW JERSEY PLAN CONTRACT

The Medical-Surgical Plan of New Jersey has revised its contract, making it possible for physicians to make additional charges under the following conditions: ¹

If the patient shall have been admitted to a hospital for a private accommodation not exceeding one bed per room.

If the patient shall have been admitted for semiprivate or ward accommodations and shall have agreed to pay the participating physician an additional amount; except that additional amounts shall not be payable if under the "single contract" the annual income of the subscriber is less than \$2,000 or under the "family contract" the annual income of the subscriber is less than \$2,000 plus \$500 for the first enrolled dependent plus \$250 for each additional enrolled dependent.

If the income of the subscriber is more than that stated in the preceding paragraph but he has failed to divulge the existence of the contract to the physician.

The amounts payable for obstetric care shall not be considered as including payment for antepartum and postpartum care rendered outside the hospital.

Amounts payable by the plan will be paid for obstetric deliveries occurring in the home or elsewhere outside the hospital under conditions beyond the control of the patient.

Services rendered at the time of full term obstetric deliveries or for tonsillectomies will not be eligible for payment unless rendered at least nine months after the effective date of the subscriber's contract.

Amounts up to \$25 will be payable for emergency services rendered in caring for accidental injuries which would ordinarily be hospitalized, if services are rendered in outpatient departments or elsewhere outside the hospital, provided the services are rendered within twenty-four hours of the accident.

Medical services (not surgical) eligible for payment will be limited to such services rendered during twenty-one days of hospitalization during any one contract year.

PREPAYMENT PLAN IN GEORGIA

According to the bulletin of the Fulton County (Ga.) Medical Society for June 1 the Fulton County society presented a skeleton plan for medical and surgical care to the house of delegates of the Medical Association of Georgia at its recent meeting. The plan provided that the control be vested in the Medical Association of Georgia and was favored by the reference committee and adopted by the association.

According to the bulletin, "Voluntary health plans of other states will be studied and the cooperation of state, county and municipal authorities solicited in the formation of a workable pattern to assure the people of our state better distribution and accessibility of medical and surgical care and adequate hospitalization."

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Psychiatric Rehabilitation Clinic.—The department of psychiatry of the Mount Zion Hospital of San Francisco has opened a psychiatric rehabilitation clinic for the treatment of ex-servicemen and women discharged from the armed forces because of neuropsychiatric disabilities.

Surcharge Over Existing Industrial Accident Fees.—The state industrial accident commission has approved a surcharge of 15 per cent over existing industrial accident fees, effective August 1. The surcharge will be effective for the duration of the war. According to the *Bulletin* of the Los Angeles County Medical Association, the commission proposes to establish a study committee to consider "a permanent medical fee schedule to become effective after the 'duration'." The commission has had under consideration for some time a proposed schedule of medical and surgical fees for some 547 procedures which might be undertaken in compensation work. While the proposed schedule has not been approved, the surcharge of 15 per cent for existing fees was approved. The provision covering the surcharge states that "cases under treatment before and after Aug. 1, 1944 shall have their medical and surgical charges segregated, so that services rendered before Aug. 1, 1944 shall be charged at the existing rates and services rendered after August 1 shall be billed at existing rates plus the 15 per cent surcharge."

DISTRICT OF COLUMBIA

Personal.—Sir Howard Walter Florey, professor of pathology at the University of Oxford, England, who is largely concerned with the development of penicillin and its use, visited Washington during the first week in August.—Dr. J. Winthrop Peabody, Washington, has been elected an honorary member of the Sociedad Chilena de Tisiologia.

ILLINOIS

Society News.—Dr. Alexander J. Kotkis, St. Louis, discussed "Some Problems of Physical Medicine in the Field of Therapeutics" before the Madison County Medical Society in Granite City, September 1.

Chicago

Food in International Relations.—The twentieth annual institute of the Norman Wait Harris Memorial Foundation was held at the University of Chicago, September 4-8. The theme of the meeting was "Food in International Relations" and speakers included Conrad A. Elvehjem, Ph.D., Madison, Wis.; Karl Brandt, Dr. Agr., Stanford University, Calif., and Paul H. Appleby, LL.D., assistant director of the Bureau of the Budget, Washington, D. C. Among other speakers at the meeting were Dr. Frank G. Boudreau, chairman of the food and nutrition board, National Research Council; John D. Black, Ph.D., Harvard University, Cambridge, Mass.; Dr. Andrew C. Ivy, head of the department of physiology and pharmacology, Northwestern University Medical School; Dr. Paul R. Cannon, chairman of the department of pathology, University of Chicago School of Medicine; Leonard A. Maynard, Ph.D., School of Nutrition, Cornell University, Ithaca, N. Y., and Ancel B. Keys, Ph.D., University of Minnesota, Minneapolis.

KANSAS

New Secretary of Sedgwick County.—Mr. Martin Baker, Wichita, formerly instructor in music at the Wichita North High School, has been chosen executive secretary of the Sedgwick County Medical Society. He fills the vacancy that occurred when Mr. Oliver Ebel resigned to become executive secretary of the Kansas Medical Society.

New Building for Research in Psychiatry.—On July 24 the Menninger Foundation opened a new building for research and education in psychiatry at 3614 West Sixth Avenue, Topeka. The new building has twenty-five rooms, including soundproof laboratories, class rooms and offices and a large conference room, and houses the work of the research, teaching

and administrative departments of the foundation. The educational work of the foundation consists at present in the teaching of resident physicians in psychiatry, the postgraduate training of nurses and the teaching of psychologists, therapists and psychiatric social workers. Plans are being completed for postwar instruction of physicians in psychosomatic medicine. The Menninger Foundation was established in 1942 as a non-profit organization to advance research and education in neuropsychiatry. It announces the publication soon of the results of a three year research project on the "Validation and Evaluation of Psychological Testing Technics." This will be the second report of the foundation's research project to appear in book form, the first being a monograph entitled "Emotions and Memory." Among projects under way at the present time are "An Investigation of the Applications of Hypnosis in Modern Psychiatry" and "An Investigation of the Clinical Syndrome of Firesetting." A preliminary report of the former was presented at the 1944 session of the American Psychiatric Association.

KENTUCKY

Personal.—Dr. William J. Walter, Pikeville, has been appointed director of the Pike County Health Department.

State Medical Meeting in Lexington.—The Kentucky State Medical Association has designated its 1944 meeting at the Phoenix Hotel, Lexington, September 18-20, the Benjamin Rush Palmer Memorial Meeting in honor of the ninth president of the association, who served from 1860 to his death in 1865. The meeting will be under the presidency of Dr. James H. Pritchett, Louisville. Speakers will include:

Dr. John A. Toomey, Cleveland, Chemotherapeutics in Pediatrics.
Dr. Maurice Levine, Cincinnati, Psychosomatic Medicine.
Col. Anthony J. Lanza, M. C., Present Status of Industrial Medicine.
Major Gen. David N. W. Grant, M. C., Current Problems in Aviation Medicine.
Dr. Frederick H. Falls, Chicago, The Present Status of Pain Relief in Labor.
Dr. William D. Stroud, Philadelphia, Cardiovascular Diseases.
Dr. Ralph Pemberton, Philadelphia, Arthritis.
Brig. Gen. Fred W. Rankin, M. C., Medical Service in a Theater of War.
Dr. Irvin Abell, Louisville, Surgical Aspects of the Chronic Dyspepsias.
Col. John B. Youmans, M. C., Nutrition—Its Relation to Deficiency Diseases.

The oration in medicine will be delivered Tuesday by Dr. Frederick G. Speidel, Louisville, on "Conservatism and Liberalism in Medicine" and the oration in surgery Wednesday by Dr. James Farra Van Meter, Lexington, on "Penicillin—An Early Evaluation in Surgical Complications." A public meeting will be held Tuesday evening in the auditorium of the U. S. Public Health Service Hospital, at which the speakers will include Drs. Oscar O. Miller, Louisville, president-elect of the state society, on "Some Aspects of the Tuberculosis Problem"; Roger I. Lee, Boston, President-Elect of the American Medical Association, "Accelerated Medicine Today and Tomorrow," and Edward H. Cary, Dallas, "The Medical Profession and Federal Legislation." One session will be devoted to chemotherapy (penicillin), the civilian aspect to be presented by Dr. Donald G. Anderson, Boston; medical aspects, Brig. Gen. Hugh J. Morgan, M. C.; surgical aspects, Col. Burr N. Carter, M. C., and venereal disease treatment by Lieut. Col. Thomas H. Sternberg, M. C. There will be a symposium on tropical diseases Wednesday at which the speakers will be Rolla E. Dyer, assistant surgeon general, U. S. Public Health Service, Capt. Alphonse McMahon (MC), and Brig. Gen. James S. Simmons, M. C. The twenty-second annual meeting of the Woman's Auxiliary to the state medical association will be held at the Lafayette Hotel, Lexington, September 18-20.

MICHIGAN

State Medical Meeting in Grand Rapids.—The seventy-ninth annual session of the Michigan State Medical Society will be a postgraduate conference on war medicine at the Civic Auditorium and the Pantlind Hotel, Grand Rapids, September 27-29, under the presidency of Dr. Claude R. Keyport, Grayling. Included among the speakers will be:

Dr. Geza de Takats, Chicago, Vascular Disease.
Dr. Earl D. Osborne, Buffalo, The Treatment of Eczema (Dermatitis).
Based on Etiology.
Dr. Robert A. Moore and Edward Mallinckrodt Jr., St. Louis, The Pathology of Rickettsial Diseases.
Dr. John W. Harris, Madison, Wis., The Place of the General Practitioner in the Practice of Obstetrics.
Dr. Arthur W. Proetz, St. Louis, Allergy in the Ear, Nose and Throat.
Dr. Tom D. Spies, Birmingham, Ala., and Cincinnati, Vitamins and the Practice of Medicine.
Dr. Max M. Zinner, Cincinnati, Gallbladder.
Dr. Albert D. Ruedemann, Cleveland, The Protruding Eye.
Dr. Joseph L. Baer, Chicago, Prolonged Labor.

Dr Emery A Rovenstine New York, The Preanesthetic Preparation of the Surgical Patient
Dr Frank H Krusen Rochester, Minn., A Rehabilitation Program for Military Veterans
Dr Abel A Applebaum Toledo, Ohio Primary Atypical Pneumonia
Dr Sidney Farber, Boston, Some Organic Digestive Disturbances in Early Life (Nature, Diagnosis and Treatment)
Dr S William Becker, Chicago, Penicillin in the Treatment of Syphilis
Dr Arthur C Curtis Ann Arbor, Mich Recent Advances in the Treatment of Syphilis
Dr Charles A Aldrich Rochester, A Preventive Medical Program as Applied to Pediatrics
Dr Frederick H Falls Chicago, Obstetrical Hemorrhages
Dr James L Wilson New York Advance in the Prevention and Treatment of Poliomyelitis

Military speakers will include

Brig Gen Charles C Hillman M C Tropical Medicine
Capt Arthur W Frisch, M C, Sulfonamide Resistant Gonorrhea
Major Frank H Mayfield M C, Herniated Nucleus Pulposus
Hermann E Hilleboe medical director and Eugene J Gillespie, senior assistant surgeon, U S Public Health Service, The Role of the General Practitioner in Tuberculosis Control
Col William C Menninger, M C Neuropsychiatry and the General Practitioner Lessons Learned from the Army
Charles J Clark, flight surgeon and Harry Britton, assistant flight surgeon, What We Have Learned About Aviation Medicine
Brig Jonathan C Meakins R C M C, What a Modern Army Health Service Should Be

On Wednesday evening Preston Bradley, LL D, Chicago, will deliver the Andrew P Biddle Oration on "When Doctors Disagree" Thursday evening has been designated "State Society Night" and speakers will include Dr Robert L Novy, professor of clinical medicine, Wayne University College of Medicine, Detroit, and John F Hunt, executive and director of research Footc, Cone and Belding, advertising agency, Chicago, on "What the People of Michigan Think of Medicine" Features of the annual session will include a series of seventeen discussion conferences (quiz periods) covering general practice and the various specialties The county secretaries' conference will be held Wednesday evening, September 27, the speakers will be Dr L Fernald Foster, Bay City, on "The Michigan Picture in Medicine", Mr M C Smith, Lincoln, Neb., "Nebraska's New Medical Practice Act," and Dr Freeman A Brockenshire, Windsor, Ont, Canada, "Health Insurance Proposals in Canada" The Woman's Auxiliary will meet at the Panthind Hotel, September 26 28 The lecture by Dr Hilleboe is sponsored by the Michigan Tuberculosis Association The American College of Chest Physicians, Michigan chapter, and the Michigan Pathological Society will meet during the session

NEW YORK

Rheumatic Heart Disease Program—The Yonkers Tuberculosis and Health Association recently launched a program for the control and treatment of rheumatic heart disease in Yonkers, involving the establishment of a special clinic for prevention, control and study of the disease and a coordinated citywide educational project, according to the *Westchester Medical Bulletin* The clinic is to be located at St John's Riverside Hospital, Yonkers, equipped and financed by the hospital, and will include a fluoroscope, laboratory and electrocardiographic facilities The tuberculosis and health association will provide a salary for a specially trained worker who will study the work with the patients at the clinic, the home background of rheumatic children, and will assist in an advisory and teaching capacity with the nurses of the city health department, the Visiting Nurse Association and the hospital and school nurses

Report on Mental Patients—The temporary commission on state hospital problems in a recent report recommended that steps be taken to make insulin shock therapy available in the future to dementia precox patients in all state hospitals for the insane In order to obtain a consistent use of the new treatment, the commission urged that a consulting service be established in the state department of mental hygiene to assure adequate records, to hold consultations with hospital staffs and to make follow-up studies The offering of special courses to train personnel at the New York State Psychiatric Institute and Hospital also was urged The report stated that 1,128 dementia precox patients treated at the Brooklyn State Hospital "did substantially better in all respects" than 876 patients in other state hospitals in the metropolitan area who were not so treated Fifty-five per cent of the patients who were given insulin shock therapy were enabled to become useful members of the community, 79.5 per cent of the insulin treated patients were able to leave the hospital compared with 58.8 per cent of the nontreated group and after a shorter stay.

New York City

Otto Loewi Receives Cameron Prize.—Dr Otto Loewi, research professor in pharmacology at New York University College of Medicine, has been awarded the Cameron Prize in Practical Therapeutics of the University of Edinburgh in recognition of "his fundamental work on the chemical transmission of the nervous impulse," *Science* reports

Course in Industrial Medicine.—On October 31 the Medical Society of the County of Queens will initiate a series of lectures in industrial medicine The opportunities in industrial health will be discussed by Dr James G Townsend, U S Public Health Service, and Dr William A Sawyer, Rochester, N Y Ten lectures will be offered and a certificate will be issued to those who attend the sessions showing their completion of the course

Diabetes Association to Develop New Camp.—The New York Diabetes Association on August 23 announced that it had taken title to the former Golden Rule Inn property on Mirror Lake 4 miles below Kingston, N Y, and will convert the buildings into a camp for poor diabetic children of greater New York Dr George E Anderson, Brooklyn, president of the association, estimated that \$10,000 would be needed to convert the buildings to meet the requirements of a diabetic children's camp, according to the *New York Times*

Institute of Clinical Oral Pathology.—The New York Institute of Clinical Oral Pathology will hold a symposium on "Fluorine in Dental Public Health" at the New York Academy of Medicine, October 30 Included among the speakers will be

Frederick S McKay, DDS, Colorado Springs, Colo, Fluorine and Mottled Enamel A Historical Survey
Henry Trendley Dean, senior dental surgeon, U S Public Health Service The Epidemiology of Fluorosis and Dental Caries
Dr Wallace D Armstrong, Minneapolis, The Fluorine Content of Enamel in Relation to Resistance of Teeth to Caries
Basil G Bibby, D M D Boston, Effects of Topical Application of Fluorides in Dental Caries
David B Ast, DDS, Albany, N Y, The Practicability, Efficiency and Safety of Fluorinating a Communal Water Supply Deficient in Fluorine to Control Dental Caries

NORTH CAROLINA

Physician Wills Library to County Medical Society.—The will of the late Dr Charles H Cocke, Asheville, provided that his medical library, magazines and other publications be given to the Buncombe County Medical Society Library in Asheville Dr Cocke died August 3

Bennett College Extends Health Service.—A grant of \$21,310 has been given by the General Education Board to cover a three year period to the Bennett College for Women, Greensboro, to enlarge its health program According to the *New York Times* the annual home making institute held at the college has made available to a larger community results of studies in health, home and family life When the new project is set in operation in September a full time community worker will direct it, using all the resources of the college to make available the maximum facilities in personnel The program aims to give Bennett students an understanding of how a knowledge of health can function in the community and to make the community more aware of health problems.

OHIO

Bureau of Industrial Hygiene Created.—The Cleveland City Health Department has created a bureau of industrial hygiene Mr Herbert G Dyktor, for more than four years chief of the bureau of industrial hygiene of the city of Health, Lansing, has been named chief of the new Cleveland bureau

Personal.—Dr Ewing H Crawfis, assistant superintendent and psychiatrist at the Lima State Hospital, Lima, has been appointed superintendent of the Cleveland State Hospital succeeding Dr Hans P Lec, who resigned to return to the Toledo State Hospital, Toledo —Dr John G Schwarz has been named superintendent at the Ohio Hospital for Epileptics, Gallipolis

Academy of Medicine Program.—On September 19 the annual meeting of the Academy of Medicine of Cincinnati will open its regular season Dr Chester S Keefer, Boston, will speak October 3 on "Penicillin" Subsequent programs in the society's schedule include the following

Dr Lawrence S Kubie, New York, Psychotherapy in Medical Practice, October 17
Dr Herbert C Maier, New York, Surgical Treatment of Pulmonary Suppuration November 7
Dr Shields Warren, Boston The Early Diagnosis of Cancer, November 21 (joint meeting with the cancer council)

Dr. Eugene A. Stead Jr., Atlanta, Ga., Mechanism and Treatment of Shock and Circulatory Collapse, December 5 (joint meeting with the heart council).

Dr. Frederick C. Irving, Boston, Cesarean Section, December 19.
Dr. Otto K. Engelke, Ann Arbor, Mich., The Relations Between the Health Department and the Doctor, Jan. 2, 1945.
Lieut. Comdr. Alvin F. Coburn (MC), The B. K. Rachford lectures on "Therapy and Prevention of Rheumatic Fever," January 16 and 17.
Dr. Merrill C. Sosman, Boston, X-Ray Diagnosis, February 6.

The Roger Morris Lecture of the society will be delivered February 20 by Dr. George J. Heuer, New York.

OREGON

Personal.—Carlisle P. Knight, Portland, medical director of the U. S. Quarantine and Hospital Service in Oregon, was recently given a banquet in Portland on the occasion of his retirement after thirty-six years with the U. S. Public Health Service.—Dr. Lamar A. Byers, Jackson, Tenn., has been named health officer of Coos County with headquarters in Coquille.

Survey of Child Guidance Clinics.—Dr. Milton E. Kirkpatrick, director of the division on community clinics of the National Committee for Mental Hygiene, New York, will conduct a survey of community child guidance clinics in Oregon. The survey was instituted by a number of interested agencies in the state and will determine the status of the existing program in the state and particularly in the Portland area.

TEXAS

Progress of Medical Library Plans.—Tentative plans for the construction of a new medical library building in Houston include the housing under one roof of the activities of the Houston Academy of Medicine, the Harris County Medical Society, the Postgraduate Medical Assembly, the Medical and Dental Service Bureau, the *Medical Record and Annals* and the woman's auxiliary. The proposed building would be a three story construction and contain the combined libraries of the Houston Academy of Medicine, the Baylor University College of Medicine, the M. D. Anderson Foundation for Cancer Research and the Texas University College of Dentistry. In addition, there will be an auditorium accommodating about 400 persons. It is anticipated that the construction would cost around \$450,000. At a meeting, July 19, fellows of the Houston Academy of Medicine pledged their incomes for from twelve to fifteen days to assist in obtaining needed funds.

Changes in the Faculty at Texas Medical Branch.—D. Bailey Calvin, Ph.D., has been promoted to professor of biologic chemistry and associate dean at the University of Texas Medical Branch, Galveston. New appointments include:

Thurlo B. Thomas, Ph.D., appointed assistant professor of anatomy.
Dr. Wesley F. McKinley Jr. appointed assistant professor of internal medicine.

Henry J. Ralston, Ph.D., San Francisco, appointed assistant professor of physiology.

Dr. Carl U. Dernehl appointed to assistant professor of industrial hygiene in the department of preventive medicine and public health.

Promotions at the school include:

Dr. Jack R. Ewalt promoted to professor of neuropsychiatry.
Col. Robert M. Moore, M. C. (on leave for military service) promoted to professor of surgery.

Dr. Stephen Weisz promoted to associate professor of neuropsychiatry.
Dr. Julius L. Jinkins promoted to associate professor of obstetrics and gynecology.

Dr. Henry H. Sweets Jr. promoted to associate professor of pathology and director of the John Sealy Clinical Laboratory.

Major Truman G. Blocker Jr., M. C. (on leave for military service) promoted to associate professor of surgery.

Dr. A. J. Jinkins promoted to assistant professor of obstetrics and gynecology.

Dr. Norman D. Schofield promoted to assistant professor of pathology.

WASHINGTON

Personal.—Dr. Thomas H. Biggs has been appointed health officer of Kelso in addition to his work as health officer of Cowlitz County.—Dr. Joseph H. Fitz, Montesano, has resigned as county coroner of Grays Harbor.—Dr. William Ernest Rownd Jr. was recently appointed police surgeon of Bremerton.—Dr. Emil E. Palmquist, Seattle, health officer of King County, was recently elected president of the Washington State Social Hygiene Association.

WEST VIRGINIA

District Health Conference.—"Control of Tuberculosis in West Virginia" will be the theme of the annual Southern District Health Conference, covering twenty-four counties in the state, which will be held September 29 at the Daniel Boone Hotel, Charleston.

WISCONSIN

Personal.—Dr. Arthur V. de Neveu recently resigned as medical director of the Johnston Emergency Hospital, Milwaukee, to enter private practice; he held the position for eighteen years.

Kellogg Gift for Health Education.—A grant has been given by the W. K. Kellogg Foundation of Battle Creek, Mich., to be available for five years for a program of health education in Wisconsin. The fund will be administered by the Wisconsin department of public instruction, newspapers reported.

First County Mental Hygiene Program.—Brown County has made plans to employ a psychiatrist to hold a child guidance center to further mental hygiene. This action is an extension of the program that has been carried on by the Wisconsin State Board of Health for the past two years. The county is said to be the first in the state that has inaugurated a mental hygiene program. Two members of the sever member psychiatric committee of the Brown County Board of Supervisors which has set up the program are Drs. George M. Shinnors, health commissioner of Green Bay, and Marshall W. Meyer, district health officer of the state board of health.

HAWAII

Penicillin Center.—Queen's Hospital, Honolulu, has been designated as the central distributing center for penicillin for civilian use in the Territory of Hawaii. A total of 50 million units has been allotted for distribution for the first month, the order having been placed through the War Production Board as of June 15.

Health in Hawaii.—In 1942 there were 10,422 live births reported for the Territory of Hawaii. The crude birth rate was 23.6 per thousand of estimated population, as compared with the rate of 23.0 per thousand of estimated population in 1941. Of the 10,422 live births 3,754, or 36 per cent, were Japanese; 2,764, or 27 per cent, were part Hawaiian; 1,845, or 18 per cent, were Caucasian; 1,044, or 10 per cent, were Filipino; 548, or 5 per cent, were Chinese, and 246, or 2 per cent, were Hawaiian. There were 3,397 deaths from all causes in 1942, a death rate of 7.7 per thousand of estimated population. This rate is considerably lower than the rate of 12.2 per thousand of population for 1941, when war casualties from the air raid on Pearl Harbor greatly increased the crude death rate. A comparison which excludes deaths among military personnel and civilians due to operations of war in 1941 shows that the crude death rate in 1942 was slightly higher than that recorded in 1941. The ratio of births to deaths reported for the Territory of Hawaii in 1942 was 307 births to 100 deaths. This ratio has been increasing steadily in the Territory of Hawaii in recent years up to 1941, when war casualties caused a large decrease. The ratio was 253 in 1937, 281 in 1938, 299 in 1939, 305 in 1940 and 189 in 1941. There were 405 deaths of infants under 1 year of age in 1942, an infant mortality rate of 38.9 per thousand live births. This rate was 3.5 per cent lower than that for 1941 and is the lowest infant mortality rate ever recorded for the Territory of Hawaii. The rapid decline in the infant mortality rate for the Territory of Hawaii is most impressive; during the past ten years it has been practically cut in half. The six principal causes of death and their death rates in the Territory of Hawaii in 1942 were diseases of the heart 132.7, accidents other than motor vehicle 90.9, cancer and other malignant tumors 64.9, tuberculosis 62.8, nephritis 58.5 and pneumonia (all forms) and influenza 47.5 per hundred thousand estimated population. These causes accounted for more than 59.6 per cent of all deaths. Relatively large decreases in the death rate were reported in 1942 for cancer and other malignant tumors and for intracranial lesions of vascular origin. Increases in the death rate were recorded for tuberculosis, cerebrospinal (meningococcic) meningitis, diseases of the heart, pneumonia (all forms) and influenza, nephritis, suicide, homicide, motor vehicle accidents and other accidents. The death rate for cerebrospinal (meningococcic) meningitis reached epidemic proportions in 1942 in the territory, as on the mainland of the United States. Because of the increased military activity in the Hawaiian theater of operations the increase in the accident death rate was not unexpected. A large increase in deaths from air transport accidents accounted for the greater part of the increase in the accident death rate. The suicide death rate in 1942 was one of the highest recorded for the territory since its admission to the registration area. The suicide death rate increased from 14.8 per hundred thousand of population in 1941 to 22.4 in 1942. This high rate is an unusual occurrence in a war year.

GENERAL

Tropical Medicine Society Admitted to National Research Council.—At a recent meeting of the executive committee of the division of medical sciences, National Research Council, it was voted unanimously to admit the American Society of Tropical Medicine to membership in the division.

Fellowships in Child Psychiatry.—A limited number of fellowships are being offered for training in extramural child psychiatry. Selection for these fellowships is made by the National Committee for Mental Hygiene, by which eligible applicants are to be recommended for appointment, the term and plan of the fellowship to be determined by the peculiar needs of the applicant. Candidates should have at least a general internship and two years of psychiatry in an approved mental hospital in addition to other qualities fitting them for extramural service. The stipends vary slightly with location and status of the fellow but in general range between \$2,000 and \$2,400. Additional information may be obtained from Dr. Milton E. Kirkpatrick, National Committee for Mental Hygiene, 1790 Broadway, New York.

The G. I. Joe Literary Award.—E. P. Dutton and Company, Inc., New York, announces the G. I. Joe Literary Award of \$5,000 for the best book manuscript submitted by a service man or woman of any rank, in any branch of the U. S. Service, wounded in action in the present world war. Half of the cash award will be paid on acceptance of the manuscript and the other half on its publication, all as an advance against royalties, under a publisher's regular contract. Professional correspondents are excluded. In making the announcement, E. P. Dutton and Company states:

Whether these books tell the story of hope or disillusionment is not the publisher's concern. They are looking for the best selection possible of fiction or nonfiction, and poetry, which is definitely going to be written—is being written today—by the men and women who feel that they must get down in print what they think and feel about their shattered world. And it is to the wounded, first to return from the battle fronts, that the publishers offer this award.

Prize Contest for Physician Artists.—The American Physicians Art Association, through the cooperation of Mead Johnson and Company, announces a prize contest for medical officers in the armed forces and civilian physicians. "Courage and Devotion Beyond the Call of Duty" has been designated the theme of the contest, and physicians may use any one of the following mediums: painting in oil or tempera; water colors, transparent or opaque; sculpture in any medium; drawing, any medium; prints, etching, engraving, lithograph, wood block or linoleum block, and photography, including bromure, tinted and kodachrome. The purpose of the competition is to memorialize the heroism and devotion of the medical profession. The prize winning subjects will remain the property of the physician-artist, but the American Physicians Art Association shall have reproduction rights and also the privilege, for a period of three years after the close of the contest, of displaying prize winning objects at art museums, libraries, county medical societies, medical schools and similar institutions. That association shall also have the right to offer the prize winning works to any of these groups to use as murals, cornerstones, architectural designs and the like to memorialize the importance of the medical profession in war and in peace. The contest will expire May 20, 1946 in order that the prize winning objects may be ready for hanging at the annual session of the American Medical Association in June 1946. Any physician member of the American Physicians Art Association, including medical officers in the armed forces of the United States and Canada, are eligible to compete in the contest. A list of forty-two prizes will be divided equally, one set of prizes to be awarded to medical officers in the armed forces and the other to civilian physicians. Additional information may be obtained from Dr. Francis H. Redewill, secretary, American Physicians Art Association, Flood Building, San Francisco.

Suicide Rate Declines.—The suicide rate in the United States is now about one fifth lower than before the war, according to statisticians of the Metropolitan Life Insurance Company, who base their conclusions on the company's mortality records. In a release, July 27, it was stated that it is a familiar fact that suicides decline during wartime. From the two years following Pearl Harbor, 1942-1943, the suicide rate among the industrial policyholders was lower by about one fifth than the rate for the preceding three years. In 1943 the suicide death rate among these insured established a new low record. The death rate last year among this group at ages 1 to 74 was 6.8 per hundred thousand as compared with 7.7 in 1942 and 8.2 in 1941. The current records indicate that the death toll from suicide is still being further reduced. Among white male policyholders the greatest decline in sui-

cides in 1942-1943, about one third as compared with prewar years, was at the later ages, where the toll is the heaviest. Among white women the greatest percentage decline, also about one third, occurred at the younger ages, 15 to 24, where the suicide rates are at their lowest. The Metropolitan statisticians attribute the general decline in the suicide rate in recent years principally to the "prevalence of favorable economic conditions and the psychological effect of the war." It is pointed out that the sharp decrease in the number of suicides committed by men at older ages "has probably been due, for the most part, to the opportunities for employment at relatively high wages. And the economic factor has also undoubtedly played a large role in reducing suicides among adolescent girls and young women. This is particularly gratifying, since it might have been expected that the wartime conditions which have increased delinquency among young girls might also have adversely affected their suicide rate." The statisticians also express the conviction that a psychologic factor has played a part in reducing the toll from suicides "by the subordination of petty personal considerations to the broader needs of the nation at war."

Report of Academy of Pediatrics.—A far reaching program to develop medical and health services for children is reflected in the report of various committees of the American Academy of Pediatrics published in the *Journal of Pediatrics* for August. In all its activities the academy emphasizes the cooperation of its members through its state fellowship. The committee for cooperation with nonmedical groups sees a new field for cooperation with the General Federation of Women's Clubs of America, in which two million young girls are enrolled and which devotes much of its teaching and training along health lines. The committee on governmental and medical agencies, which over a period of years developed a seven point program demonstrating how a state academy fellowship could be of constructive service to better child health through cooperation with state, governmental and medical agencies, plans to present to the academy of pediatrics at its November meeting a proposed study whereby the services to these many agencies could be improved. Some of the activities needing increased integration are hospital ward service, hospital clinic service, public health conferences, preschool and child health conferences, school health services, child guidance and mental hygiene program, adolescent hygiene programs, the pediatric part of tuberculosis case finding, immunization clinics, the pediatric part of crippled children's clinics, the pediatric services involved in voluntary health insurance programs and the medical supervision of children's camps. The report of the committee on Pan American scholarships indicates that the main difficulty of persons receiving these scholarships, which were made available by several sponsoring groups, was an insufficient knowledge of English, a problem which has been recognized and since controlled. At the second Congress on Pediatrics in Mexico City, March 26-April 1, fifteen fellowships in the academy were awarded to persons residing in Mexico. The activities of the committee on national defense continue to be centered on the medical supervision of refugee children in cooperation with the United States Committee for the Care of European Children. Groups of physicians have been organized to examine and to provide medical care for these children at various reception centers before placement. Examinations have included Schick and Mantoux tests and chest x-rays of positive reactors. At intervals from April 1, 1943 to the time of the report, seven groups comprising 80 children were received in three centers located in Pleasantville, N. Y., Bronx, N. Y., and Newark, N. J. To assure the best results, the coordination and perhaps consolidation of various committees and agencies concerned with the care of children is urged. The integration of effort is particularly important both for the present emergency and for the future development of the nursery and child care centers. In the formulation of plans for particular areas the consultation of members of the academy is urged. The special committee on rheumatic fever has pledged itself to cooperate in the rheumatic fever problem and to aid in the program to be carried out by the newly organized Council on Rheumatic Fever (*THE JOURNAL*, September 2, p. 42).

CORRECTION

Hospitalization of Dependents of Naval Personnel.—In the first item appearing on page 1047 of *THE JOURNAL*, August 12, is the statement "For each patient admitted and for each day in the hospital, the member of the Navy or Marine Corps concerned shall pay \$7.75." The amount should have been \$1.75 instead of \$7.75.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 12, 1944.

Casualties in Normandy Flown Across the English Channel

Since D day 10,000 wounded have been brought from Normandy to England in Dakota planes flown by the British Transport Command. On the outward journey the planes carry ammunition and supplies. On the return journey each plane carries 18 stretcher cases and 6 walking wounded. Because they carry supplies on the outward flight, the ambulance machines do not bear the Red Cross insignia and claim no immunity from attack, even though they are not armed. The wounded are in charge of a woman nursing orderly. Priority cases find themselves in English hospitals at home within six or seven hours of being picked up on the battle field. The nursing orderly is qualified to administer oxygen or morphine during the flight. The United States Army has a similar aerial ambulance service to the battle front. Its flying nurses are given officer status and officer pay.

Improved Vital Statistics During the War

Dr. Percy Stocks, medical statistician of the General Register Office, has described the vital statistics of 1943 (*Lancet* 2:65 [July 8] 1944). But for the influenza epidemic at the end of the year the vital statistics of England and Wales might have been as noteworthy as those of 1942. In the first three quarters of 1943 the death rate was 11.3 per thousand, compared with 11.8 and 11.7 in the corresponding periods of 1942 and the prewar year of 1938. The rates for the years 1938-1943 were 8.52, 8.49, 9.90, 9.32, 8.09 and 8.24. In 1943 new low records were established for infant mortality (49.0 per thousand live births, compared with 50.6 in 1942 and 52.8 in 1938) and for ages 1 to 5 (3.34 per thousand living compared with 3.42 in 1942 and 52.8 in 1938). The crude birth rate rose to 16.5 per thousand in 1943, giving an approximate reproduction rate of 0.903, compared with 0.810 in 1938 and 0.853 in 1942. The tuberculosis mortality, which is usually increased by war, was much the same as before the war. Comparison with 1938 shows that deaths from respiratory tuberculosis were 619 more than those in 1938 for males but 561 less for females. The cause of the improved vital statistics during the war seems to be the abolition of unemployment.

Information to Be Disclosed to Military Authorities as to the Source of Venereal Disease

A regulation of the Ministry of Health which has given rise to much criticism provides that any one reported to the health authorities by two persons for having transmitted venereal disease can be compelled to undergo examination and treatment. The ministry has now informed military authorities that information so obtained may be disclosed to medical authorities of the British, American or other allied forces so far as it is needed to secure examination and treatment of persons alleged to be sources of infection.

Forcible Vaccination of a Soldier

A labor member asked the secretary of state for war in the House of Commons whether or not the forcible vaccination of a soldier at the command of a medical officer with the aid of four men was contrary to the regulations. The secretary replied that the man in question was vaccinated in spite of his protests that he did not wish to be vaccinated. His left wrist was held by one man and his right elbow by another. The man had no conscientious objection to vaccination but refused because on a

previous occasion he suffered from a sore arm, and in his view the vaccination and inoculations he had received had done him no good. The officer concerned had clearly no right to use force, and in normal circumstances disciplinary action would be taken against him, the secretary said. But this vaccination was carried out at the Anzio bridgehead, it was pointed out; reinforcements were arriving from Naples, where there was an outbreak of virulent smallpox, and the possibility of an outbreak on the bridgehead was causing great anxiety. In these exceptional circumstances the officer's action had been considered an error of judgment committed in good faith to safeguard the health of the troops in a dangerous medical situation. The secretary therefore would not take any disciplinary action.

Radium Precautions

The Radium Committee of King Edward's Hospital Fund for London has made some important recommendations. In the future, it is recommended that the clinical supervision of radium work in hospitals should be entrusted to the Radium Commission, which already exercises this function throughout the whole of Great Britain outside the metropolitan area. Radium and irradiation work generally have too often resulted in considerable suffering. To eliminate or at least to minimize that danger it is important that such work shall be carried out only in hospitals and institutions which can provide a full team of experts—specialists, physicians, surgeons, radiotherapists and physicists. That policy should be integrated over the whole country, the committee states.

AUSTRALIA

(From Our Regular Correspondent)

July 3, 1944

Pharmaceutical Benefits—"Free Medicine" for Australia

As part of the social security plans of the commonwealth government, a bill to provide pharmaceutical benefits was passed by the Senate on March 2. Such benefits are defined as "(a) un compounded medicines the names of which, and medicinal compounds the formulae of which, are contained in a prescribed formulary to be known as the Commonwealth Pharmaceutical Formulary; and (b) materials and appliances (not being un compounded medicines or medicinal compounds) the names of which are contained in a prescribed addendum to the Commonwealth Pharmaceutical Formulary," these benefits, available to "every person ordinarily resident in the Commonwealth," from an approved pharmaceutical chemist or, in special circumstances, a medical practitioner "on presentation of a written and signed prescription or order (which shall be in accordance with the prescribed form and written on a form supplied by the commonwealth) of a medical practitioner."

The British Medical Association feels that its members will be hampered by being restricted to a formulary. If the prescription does not conform to the formulary the medicine will not be free. To meet this objection the government will establish a permanent committee of doctors and pharmaceutical chemists to investigate all new drugs so they may be included when necessary to keep the formulary up to date. The expense of a drug will not in itself debar the drug from being included in the formulary, provided its therapeutic efficiency is established.

The procedure will be for a patient to obtain from a doctor a prescription written on a special form, in which the doctor orders whatever medicine is necessary for treatment. This prescription will be presented to an approved chemist. The fears of the Friendly Societies that their dispensaries would be excluded from the operation of this act have been overcome by an invitation to all chemists and dispensaries to apply for approval to operate under the act.

Mr. G. G. Jewkes has been appointed director of pharmaceutical services in the Commonwealth Health Department. Mr. Jewkes was formerly chief chemist under the lapsed national health insurance scheme, and he has been attached to the Social Services Department. Mr. Jewkes's appointment will be followed soon by the formation of a pharmaceutical administrative staff in each state. These staffs will comprise a chief chemist assisted by technical officers and an organization to fix prices for prescriptions. The "free medicine" plan is expected to start early next year, as soon as preliminary administrative details have been completed. The estimated annual cost is £2,100,000.

At a Friendly Societies' conference held in Canberra it was decided that the pharmaceutical benefits taken from Friendly Societies by the commonwealth government under the free medicine plan would be replaced by other benefits. Among these would be ambulance services, home and clinical nursing and care for the aged and convalescent. State associations of Friendly Societies will press for any state legislation necessary. It was also decided to consider the possibility of a change in the present system of contract medical service to eliminate income limits. This is contrary to a long established policy of the British Medical Association, which feels, with justification, that contract medical practice should be limited to those whose income does not permit them to receive medical attention by private arrangement with their doctor.

The first reaction of the medical profession to this new pharmaceutical bill was a varying degree of opposition. The Victorian branch threatened to refuse to cooperate. Previous to the passing of the bill the Australian president of the British Medical Association (Sir Henry Newland) had met government representatives and later had issued a statement that the medical profession must be untrammelled. In January the Federal Council of the British Medical Association endorsed this view and added that all prescribed medicine should be given free. The general secretary of the Federal Council of the British Medical Association (Dr. John Hunter) spent some months in Canberra before the bill was considered, in an effort to have the act improved.

The British Medical Association is concerned about clause 15 (a) of the act. By this clause the director general of health may appoint a medical man in any area on a salary basis for the purpose of writing prescriptions so that the public may obtain free medicine. It is felt that this clause will enable the director general of health to appoint a doctor in any area where the medical men are not prepared to cooperate. Should this happen, not only would the people be able to have free medicine but they would also be able to have free prescriptions and possibly free medical attention as well. The medical profession regards this clause as a sinister step toward the introduction of a cheap form of national medical service.

Typhoid Epidemic in Victoria

In March 1943 a classic milk borne epidemic of typhoid broke out in an outer suburb of Melbourne. The report of this epidemic has now been published by the Victorian Department of Public Health. There were 440 cases, with a death rate of 5 per cent. Nearly all were primary cases. Milk was established as a vehicle of infection in a few days after the epidemic commenced. As a result of the zoning system of milk distribution the milk was distributed throughout the affected area by one dairy, the milk being sold either to the public directly or by shops or depots. Milk had been received from the dairy farms in cans, mixed and cooled in bulk and then returned to the rinsed can. The pooling of milk delayed detection of the source of infection, but the investigation ultimately resulted in the discovery of a woman carrier of typhoid. This carrier was unclean in her personal and domestic habits, and the dairy was insanitary.

The incidence of those infected was highest in the 5-14 age group, followed by the 15-24 age group. Infants under 12 months were either immune to or protected against infection. Mass inoculation against typhoid was not practiced because of want of information about its efficacy in patients already infected. Inoculation was advised in individual cases for newcomers to the district, in families with a member already a patient and for persons at continued risk, such as those attending the sick or handling infected material. One interesting point was that no soldier returned from the war of 1914-1918 developed the disease, even though there were over 200 exposed to the risk. These men have had inoculations against typhoid.

The milk which was the cause of the epidemic had not been pasteurized, and this epidemic has provided a valuable object lesson in the necessity for pasteurization. Unfortunately, even this dramatic lesson seems to have failed to impress the public and the politicians with the need for this modern essential of milk distribution. Medical men and scientists have been most outspoken in their views, but the "practical" dairyman and an apathetic public have so far won the day. However, insistence by the services for pasteurized milk is having its effect.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, July 31, 1944.

Teaching of Hygiene in Brazil

The Institute of Hygiene at São Paulo University has served as the state school of hygiene in connection with the São Paulo Medical School since 1931. It has granted several kinds of certificates recognized throughout Brazil. According to the reorganization plans for the university schools in Brazil still under consideration by the Ministry of Education, the teaching of Hygiene will be made through the School of Hygiene and Public Health organized at the universities and in the medical schools in which departments of hygiene and public health have already been developed. The reorganization of the Institute of Hygiene at São Paulo University has been approved by the University Council as well as by the National Council on Education. The teaching and future development program has been approved also by Dr. Gustavo Capanema, minister of Brazilian education, as a new and valuable element in the preparation of professional personnel and for the promotion of scientific progress.

The Rio de Janeiro Institute of Psychiatry

The Institute of Psychiatry, under the direction of Professor Henrique Roxo, is a part of the University of Rio de Janeiro, where Dr. Roxo teaches psychiatry with the assistance of Associate Professors Flavio de Souza, Rodrigo Ulysses, A. Morais Coutinho and Ibrahim Jorge and the collaboration of a few specialists in allied branches of medicine. The institute is provided with about 200 beds, which serve a large number of mental patients. As the most modern therapeutic methods (including insulin therapy, malariotherapy, metrazol shock, electric shock, occupational therapy, physical therapy, vitamin therapy and calcium therapy) are fully used at the institute, the results of treatment are considered excellent, having reached the rate of about 30 per cent cures during the last year. A main feature of the institute is that it is devoted to research as well as to teaching. Dr. Flavio de Souza has lately published several papers in which he presents the results of his studies on vitamins and mental diseases, the convulsive therapy by dicrotoxin associated with metrazol, improvements in convulsive therapy by metrazol (35 per cent dextrose solution), comparison between the clinical results of the metrazol shock and electric shock treatment and circulatory velocity and metrazol shock. Dr. Paulo Lacaz, in charge of the laboratory of

the institute, has recently published papers on the Takata-Ara reaction in neuropsychiatry, biochemical aspects of metrazol convulsions, glycid metabolism in schizophrenia, and some results in the application of interferometry. Basal metabolism in mental diseases is the special field of Dr. Ulysses, and Dr. Novais Filho deals with electroencephalographic studies in the diagnosis of psychoses.

Hospital News

The mayor of Rio de Janeiro, Dr. Henrique Dodsworth, himself a physician, has ordered that the Cascadura Maternity Hospital shall be known hereafter as the Fernando Magalhães Maternity Hospital. Dr. Magalhães was a leading obstetrician and professor at the University of Rio de Janeiro, whose death was reported in *THE JOURNAL*, April 8.

The administration of the city of São Paulo has completed the necessary arrangements to buy from the Bank of Brazil, custodian of enemy properties, the hospital now known as the Japanese Hospital of that city.

Dr. Fernando Paulino Jr., a noted young surgeon of Rio de Janeiro, recently resigned the post of director of the Miguel Pereira Hospital. This municipal hospital, with 50 beds, is a specialized institution for the surgical treatment of tuberculosis.

A fire has destroyed a section of the Municipal Hospital of the city of São Paulo. Firemen saved 40 hospital patients from injury.

Blood Typing of Brazilian Soldiers

Major Rodolfo Pereira dos Santos has cited the incidence of different blood groups among Brazilian soldiers of the Italian expeditionary forces. The blood was classified of 10,811 soldiers. Results were:

	Number	Per Cent
O type (universal donor).....	5,047	or 46.63
A type.....	4,101	or 37.94
B type.....	1,285	or 11.83
AB type (universal receiver).....	378	or 3.50
	10,811	100.00

Cesarean Section Because of Diaphragmatic Hernia

Professor Clovis Salgado of Belo Horizonte, Minas Gerais, observed a pregnant woman with diaphragmatic hernia in whom a cesarean section was performed at the onset of labor. The patient had a known tuberculous lung abscess six years previously, which emptied without operation. A left phrenectomy was performed one year later. An x-ray of the digestive tract revealed the diaphragmatic hernia showing the stomach herniated into the thorax. Tubal sterilization was performed at the time of the cesarean section.

Operability of Cancer of the Rectum

Dr. R. Pitanga Santos has a large proctologic practice in Rio de Janeiro and has investigated cancer of the rectum. At the last meeting of the National Academy of Medicine he presented several of his cancer patients. Speaking on the special topic of the operability of cancer of the rectum, Dr. Pitanga Santos pointed out his policy, followed during his long practice, of always operating in this condition, whatever the state of the patient. He declared that he has obtained good results in many cases considered hopeless by other doctors. Dr. Pitanga Santos insisted on the point that the mere age of the patient should not be considered a contraindication to surgery; he presented a woman of 84 who had been operated on at the age of 70 when she was considered by several other physicians as in a desperate plight. He presented several more aged patients who had been cured of cancer of the rectum. As a rule he employs a special surgical technic that he devised himself, using the peritoneal route, through a wide incision in three directions; this affords an ample operating field to enable the use of the electric knife, which he frequently employs.

Pathology and Clinical Treatment of the Thyroid

Under the direction of Dr. J. Peregrino Junior, the endocrinologic department of the Policlínica Geral of Rio de Janeiro, a medical institution which operates several large medical and surgical outpatient clinics, is now giving an extensive course on the pathology and clinical treatment of the thyroid. Drs. Moreira da Fonseca, Luis Feijó, Frederico MacDowell, Raymundo Brito and Xavier Pedrosa are teaching the different parts of the course. The emphasis given to the thyroid this year is explained by the increasing importance of this subject in Brazil. Of a thousand cases of glandular diseases attended at the endocrinologic department of the Policlínica, 38.7 per cent were diseases of the thyroid. In several thousand school children in the state of São Paulo Arruda Sampaio has found 18.2 per cent with goiter, and the rate reaches 60 per cent in some localities of the same state. Moreover, in spite of the fact that the thyroid is the best known of all the endocrine glands, it is in the diagnosis and treatment of its diseases that the general physician errs the most.

Brief Items

Dr. Annibal Vargas, a specialist in physical medicine practicing in Rio de Janeiro since 1909, died recently at the age of 64. He was the first to suggest the simultaneous production of faradic and galvanic electric currents in the same apparatus as a therapeutic procedure.

Dr. Joaquim A. de Brito, head surgeon of the Municipal Emergency Hospital of Rio de Janeiro, and Dr. Flavio P. de Figueiredo, physician of the Division of Tuberculosis of the Department of Health of the same city, have left for the United States to spend some time, respectively, at the Massachusetts General Hospital and at the Municipal Tuberculosis Sanitarium of Chicago.

Major Arlino C. de Carvalho has been appointed ad interim director of the Brazilian Army Medical School.

Under the direction of Dr. Paulo Cesar de Andrade, the old Misericórdia Hospital of Rio de Janeiro is being progressively enlarged and refitted and the services improved. The latest addition in the plan of improvement is the publication of a medical magazine under the title *Anais da Santa Casa de Misericórdia do Rio de Janeiro*, to record the study of the cases treated in the hospital.

Dr. A. Saint-Pastous, president of the University of Porto Alegre, state of Rio Grande do Sul, recently resigned this position.

Dr. Raul Moreira, dean of the school of medicine of the University of Porto Alegre, has resigned his post. Dr. J. Pereira Filho, professor of medicine at the same school, has been appointed dean.

Col. Emmanuel Marques Porto, now stationed somewhere at the war front in Europe, has been appointed head of the Medical Service of the Brazilian Expeditionary Force. Lieut. Col. A. Marques Torres has been appointed head of the medical service of the first infantry division of the same force.

Marriages

TOM GROVER ORR JR., Kansas City, Mo., to Miss Jean De Vore Robertson of Marysville, June 24.

ROBERT MATTHEW BERNE to Miss Beth Adele Goldberg, both of New York, August 18.

DAVID OLAN MEYER to Miss Marion Louise Ingraham, both of New York, August 8.

CHARLES O. PETERS to Mrs. Mabel Rindernecht, both of Erie, Pa., April 27.

WILLIAM C. F. SMITH, Erie, Pa., to Miss Louise Falk of Warren, May 20.

Deaths

Groesbeck Francis Walsh Ⓢ Fairfield, Ala.; Northwestern University Medical School, Chicago, 1902; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; member of the American Public Health Association, American Academy of Tuberculosis Physicians, National Tuberculosis Association, American Trudeau Society, American Association of Industrial Physicians and Surgeons, American Academy of Physical Medicine, American Association for the Advancement of Science, Southern Medical Association and the Alabama Academy of Science; entered the medical service of the Isthmian Canal Commission in 1905 and remained in the service until 1910; during varying periods of the time had been in charge of the line hospitals at Culebra, Las Cascades, Miraflores and La Boca; served as adviser in health matters to the republic of Nicaragua and for many months as American Consul in the Nicaraguan port of Corinto; attached to the medical department of the Madeira Mamore Railroad, engaged in constructing a line around the cataracts of the Madeira River, from 1910 to 1911; during the major portion of the time had been in charge of surgical work at Candelaria Hospital, Amazonas, North Brazil; life member of the Madeira Mamore Society, formed by the survivors of this expedition; for a year had been in charge of the medical work of the Butters Mining Company at Divisadero in the republic of Salvador; chief of the laboratory division, Naval Operating Base, Hampton Roads, Va., during World War I, and was attached to the U. S. S. *Sierra* and the U. S. S. *Montgomery*, serving six months overseas on the Naval Transport U. S. S. *Orizaba*; assistant superintendent of the health department of the Tennessee Coal, Iron and Railroad Company since 1913 and chief of the medical clinic of the Employees' Hospital since 1919; died September 1, aged 66, of carcinoma of the urinary bladder.

Jerome Kingsbury, New York; Bellevue Hospital Medical College, New York, 1897; member of the Medical Society of the State of New York, American Dermatological Association and the American Academy of Dermatology and Syphilology; specialist certified by the American Board of Dermatology and Syphilology; professor of dermatology and syphilology at the New York Polyclinic Medical School and Hospital; for five years a member of the Seventh Regiment of the New York National Guard; served in France with the American Expeditionary Forces during World War I; colonel in the medical reserve corps; surgeon of the city patrol corps; formerly on the staff of the New York Skin and Cancer Hospital; director of dermatology at the Midtown Hospital; consulting dermatologist to the Harlem Eye and Ear Hospital, New York City Hospital, Welfare Island, North Eastern Dispensary and the Northern Dispensary; attending dermatologist to the New York Polyclinic Hospital, where he died July 15, aged 73, of cerebral hemorrhage.

Edward Milum Barnes, Tampa, Fla.; Memphis (Tenn.) Hospital Medical College, 1913; on the courtesy staff of the Tampa Municipal Hospital; died July 19, aged 62, of coronary thrombosis.

Bert Montrose Barringer, Emden, Ill.; Illinois Medical College, Chicago, 1904; member of the Illinois State Medical Society; on the staffs of the St. Clara's Hospital and the Evangelical Deaconess Hospital, Lincoln, where he died July 26, aged 77, of heart disease.

Edward Theodore Biber, Boise, Idaho; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; member of the Idaho State Medical Association; for two years a member of the health department of Chicago; for many years on the staff of St. Luke's Hospital; died July 22, aged 69.

Alexander Walter Burke, Chicago; Loyola University School of Medicine, Chicago, 1916; served in the medical corps of the U. S. Army in France during World War I; temporary medical examiner for the administrator of civil aeronautics from May 1943 to May 1944; flight surgeon at the Municipal Airport; died in a hospital at Memphis, Tenn., June 4, aged 57, of heart disease.

Joseph Butler, San Francisco; College of Physicians and Surgeons of San Francisco, 1905; died in the Southern Pacific Hospital in July, aged 71.

Edwin Myron Case Ⓢ Canton, Ohio; University of Nebraska College of Medicine, Omaha, 1933; served an internship at the St. Louis City Hospital, St. Louis; formerly a

member of the Civilian Conservation Corps in Middle River, Minn., and Crystal Springs, Ark.; on the staff of the Aultman Hospital, where he died July 22, aged 44.

James Horace Chism, Carthage, Tenn.; Vanderbilt University School of Medicine, Nashville, Tenn., 1908; died in June, aged 59.

James Brewer Cochran, Dyersburg, Tenn.; University of Tennessee College of Medicine, Memphis, 1933; member of the Tennessee State Medical Association; served an internship and residency at the Methodist Hospital in Memphis; on the staff of the Baird-Brewer Hospital, where he formerly served as medical superintendent; died July 18, aged 34, of coronary occlusion.

William Henry Copeland, La Jolla, Calif.; Bellevue Hospital Medical College, New York, 1885; died July 3, aged 84.

John Joseph Cummings Ⓢ Worcester, Mass.; Columbia University College of Physicians and Surgeons, New York, 1899; member of the New England Obstetrical and Gynecological Society; for many years on the staff of St. Vincent Hospital; died in Misquamicut, R. I., July 9, aged 74, of heart disease.

Lucius M. Ellis, Houston, Texas; Baylor University College of Medicine, Dallas, 1912; member of the State Medical Association of Texas; died July 8, aged 65.

Homer Harvey Ewing, Willard, Ohio; Cleveland Homeopathic Medical College, 1898; member of the Ohio State Medical Association; past president of the Huron County Medical Society; chairman and for many years a member of the board of health of Huron County; on the staff of the Willard Municipal Hospital, where he died July 20, aged 75, of pneumonia.

Charles William Louis Hacker Ⓢ Albany, N. Y.; Albany Medical College, 1905; served at his alma mater as clinical assistant and instructor in surgical pathology, assistant in pathology and bacteriology, lecturer, instructor in surgery, and since 1937 associate in surgical pathology; member of the American Urological Association; fellow of the American College of Surgeons; associate attending surgeon, Albany Hospital, where he died July 7, aged 60, of acute peritonitis following chronic cholecystitis.

Otto William Hinn Ⓢ Cicero, Ill.; Bennett Medical College, Chicago, 1912; on the staffs of the Loretto and Walther Memorial hospitals, Chicago; died July 20, aged 59, of heart disease.

Bertalan Hoch, Jersey City, N. J.; Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pecs, Hungary, 1923; formerly assistant in medicine at his alma mater and its hospital; served an internship at the Jersey City Hospital; died July 10, aged 46, of coronary thrombosis.

John Dan Hogue Ⓢ Altoona, Pa.; Jefferson Medical College of Philadelphia, 1905; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; served overseas during World War I; member of the staff of the Mercy Hospital; examiner for the Civil Aeronautics Authority; died in the Altoona Hospital July 19, aged 62, of carcinoma of the prostate.

Thomas J. Hollingsworth Ⓢ South Haven, Kan. (licensed in Kansas in 1901); past president of the Sumner County Medical Society; died July 10, aged 89, of arteriosclerosis.

José E. Igartua Ⓢ Aguadilla, P. R.; University of Maryland School of Medicine, Baltimore, 1911; past president of the Aguadilla District Medical Association; examiner for draft board during World War I; senior medical officer, department of radiology, Aguadilla District Hospital; died May 15, aged 54, of cardiovascular renal disease.

Dominick Philip Douglas Jackson Ⓢ Little Falls, N. J.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1932; on the staffs of the St. Joseph's Hospital, Paterson, and the Community Hospital, Montclair; died suddenly July 9, aged 39, of coronary thrombosis.

Milton Carr John Ⓢ Stuttgart, Ark.; University of Nashville (Tenn.) Medical Department, 1903; served as president of the Arkansas County Medical Society; formerly counselor of the Third District of the Arkansas Medical Society; a member of the board of trustees of the Arkansas Tuberculosis Sanatorium, State Sanatorium; died June 9, aged 67.

George Brinton Kessler, Elgin, Ill.; Tennessee Medical College, Knoxville, 1899; at one time health officer of Cowley County, Kan.; a member of the Selective Service board in Sullivan during World War I; died in St. Joseph Hospital July 28, aged 79, of chronic myocarditis and arterio-sclerosis.

Frank Dietrich Kilgore, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1898; served during World War I; died June 24, aged 68.

Quintin Solomon Kocher, Bridgeville, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1892; school physician; on the staff of the Canonsburg General Hospital, Canonsburg; died in the Mercy Hospital, Pittsburgh, June 16, aged 73, of diabetes mellitus.

Amos D. Krewson, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1889; on the staffs of the Frankford and Northeastern hospitals; died July 8, aged 82, of angina pectoris.

Ralph Curtis Lowe, Media, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1928; member of the Medical Society of the State of Pennsylvania; served an internship and residency at the Women's Homeopathic Hospital, Philadelphia; died in the Hahnemann Hospital, Philadelphia, July 2, aged 42.

August E. Lundgren, Chicago; American College of Medicine and Surgery, Chicago, 1905; for thirty-eight years an examiner for the Metropolitan Life Insurance Company; on the staff of the University Hospital, where he died July 27, aged 71, of carcinoma of prostate.

William J. Merdian, Detroit; Detroit College of Medicine, 1890; formerly health officer of Grosse Pointe Park; physician for the draft board during World War I; died June 18, aged 75.

Marie A. Olsen * Chicago; Woman's Medical College, Chicago, 1891; an Affiliate Fellow of the American Medical Association; on the staff of the Norwegian American Hospital, where she died July 11, aged 80, of cerebral hemorrhage.

Edmund Joseph O'Shaughnessy * New Canaan, Conn.; University and Bellevue Hospital Medical College, New York, 1899; served during World War I; major in the medical reserve corps, not on active duty; chief, emergency medical service, New Canaan defense council; on the staff of the Stamford Hospital, Stamford, where he died July 2, aged 76, of cerebral hemorrhage.

Ernest Abram Moore, Bay Minette, Ala.; Louisville (Ky.) Medical College, 1906; served during World War I; formerly mayor of Bay Minette; died June 19, aged 62, of acute dilatation of the heart and chronic myocarditis.

Ralph Marcellus Morrill, Lincoln, Neb.; Bennett Medical College, Chicago, 1900; died suddenly June 30, aged 69.

Ellwood Oliver * Pine Plains, N. Y.; Albany Medical College, 1894; on the courtesy staff of the Vassar Brothers' Hospital, Poughkeepsie; died July 6, aged 73, of diabetes mellitus and nephritis.

James William Parker * Chicago; University of Illinois College of Medicine, Chicago, 1920; served an internship at the Grant and Chicago Lying-In hospitals; formerly a fellow in surgery at the Mayo Foundation in Rochester, Minn.; served during World War I; on the staff of the Chicago Memorial Hospital; died in the Illinois Central Hospital July 16, aged 49, of chronic intestinal obstruction.

George Alpha Potter, Danville, Ill.; Barnes Medical College, St. Louis, 1903; member of the Illinois State Medical Society; on the associate staff of the Lake View Hospital, where he died July 9, aged 68, of carcinoma of the prostate.

Jesse David Price, Michigan City, Ind.; Louisville (Ky.) Medical College, 1906; member of the Indiana State Medical Association; on the staff of St. Anthony Hospital, where he died July 3, aged 72, of cerebral hemorrhage.

Otis L. Ray * Raleigh, N. C.; University College of Medicine, Richmond, 1899; for many years a member and chairman of the county board of commissioners; on the staff of the Rex Hospital, where he died July 4, aged 65.

Wilbur Fisk Reed, Cheboygan, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1877; member of the Michigan State Medical Society; for many years city health officer and county coroner; at one

time physician at the State House of Correction and Reformatory, Ionia; died June 30, aged 93, of senility.

Fred Hooper Rhoades * Hanover, Kan.; University Medical College of Kansas City, Mo., 1905; past president and secretary of the Washington County Medical Society; at one time secretary of the board of health in Altoona; clerk of the local school board for twenty-one years; health officer of Washington County; surgeon for the Union Pacific Railroad for many years; died in the Lutheran Hospital, Beatrice, Neb., June 19, aged 64.

Como Perry Richards, Everett, Wash.; University of Oregon Medical School, Portland, 1893; died May 20, aged 84, of uremia.

W. Herbert Scholtz, La Crescenta, Calif.; California Medical College, San Francisco, 1889; College of Physicians and Surgeons of San Francisco, 1901; died in Los Angeles June 9, aged 80.

Edgar Lane Tiner, Crystal City, Texas; University of Texas School of Medicine, Galveston, 1929; member of the State Medical Association of Texas; served an internship at the Santa Rosa Infirmary, San Antonio; city and county health officer; died in the Crystal Hospital June 22, aged 40, of chronic myocarditis and uremia.

Thomas Henry Trainor * Maple Park, Ill.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888; died July 5, aged 81, of heart disease.

Herbert Dillon Walker * Elizabeth City, N. C.; University of Maryland School of Medicine, Baltimore, 1902; past president of the Seaboard Medical Society; honorary member and past vice president and treasurer of the Medical Society of the State of North Carolina; for many years associated with the U. S. Public Health Service; on the staff of the Albemarle Hospital; died in the Norfolk General Hospital, Norfolk, Va., July 7, aged 67, of cerebral hemorrhage.

Charles M. Walrath, Ellicottville, N. Y.; University of Buffalo School of Medicine, 1885; formerly a druggist; served as attending physician to the Erie County Penitentiary; formerly a trustee of the village, where he served as mayor, postmaster, health officer and member of the school board; died July 9, aged 83, of chronic myocarditis and arteriosclerosis.

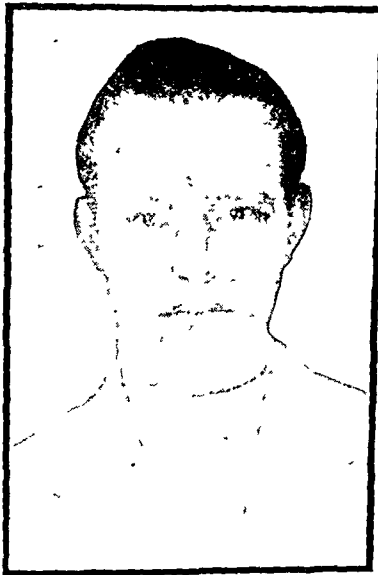
John William Weber, Beverly Hills, Calif.; Columbia University College of Physicians and Surgeons, New York, 1918; at one time on the staffs of the New York State Hospital in Ray Brook and the Santa Clara County Hospital in San Jose; formerly medical director of the Ahwahnee Tri-County Tuberculosis Sanatorium in Ahwahnee; partner and medical director of aircraft workers medical plan at the Douglas Aircraft Company, Santa Monica; died in Long Beach July 4, aged 51, of coronary occlusion.

Arthur Ellwood Whittaker * Zelienople, Pa.; University of Pittsburgh School of Medicine, 1912; served in the medical corps of the U. S. Army during World War I; on the staffs of the Rochester General Hospital, Rochester, and the Ellwood City Hospital, Ellwood City; author of "History of Ellwood City"; died July 4, aged 56, of coronary occlusion.

Joseph Carlin Williamson * Columbus, Ohio; Medical College of Ohio, Cincinnati, 1899; died July 5, aged 69.

KILLED IN ACTION

John Hall Bates, New Preston, Conn.; Yale University School of Medicine, New Haven, 1941; served an internship at the Royal Victoria Hospital, Montreal, Que., Canada; commissioned a lieutenant (jg), medical corps, U. S. Naval Reserve, on April 20, 1942; began active duty on July 15, 1942; aged 31; killed in action in the Pacific area; presumptive date of death February 2, according to the Navy Department.



LIEUT. (JG) JOHN H. BATES (MC),
U.S.N.R., 1912-1944

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices or cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Aseptex.—In December 1943 Solinger & Sons Company, Inc., New York, stipulated with the Federal Trade Commission that it would cease representing that certain mattress ticking which it treats with this product possesses such bactericidal, germicidal or fungicidal properties as to make the fabrics resistant to germs, bacteria, fungi or vermin. The respondent also agreed to cease using the words "Sanitary" and "Aseptex" to describe such ticking, so as to imply that the fabrics will be effective in preventing, checking or removing agencies, such as filth and infection, which are injurious to health.

Formula SBS-11.—The Sugar Beet Products Company of Saginaw, Mich., which puts this out, entered into a stipulation with the Federal Trade Commission in January 1944, agreeing to discontinue certain misrepresentations in its advertising. Among these were that its product is effective in the prevention or treatment of skin irritations, dermatitis, chapping or soreness; that it will remove all bacteria from the skin or can be depended on to prevent infections or act as an antiseptic under the conditions of use, or that all commercial liquid soaps contain alcohol. The concern further agreed to cease representing that Formula SBS-11 will "remove 21.3% more bacteria than any other products available" or making any other claim attributing to the product an effectiveness, either in the removal of bacteria from the surface of the skin or in the prevention of skin infections, which is exaggerated or for which there is no proper support based upon any recognized or accepted scientific test.

Kulver's East Indian Hair Dressing.—In February 1944 Wilfred Scott, trading as Decco Barber Supply Company, Roxbury, Mass., stipulated with the Federal Trade Commission that he would cease representing that this product is a hair grower, produces long hair or in any way facilitates the growth of hair, and designating such preparation as "East Indian Hair Dressing" or otherwise representing that it is a product of, or contains ingredients imported from East India or any other foreign country.

Lee's Periodic Pills and Lee's Periodic Capsules.—In December 1943 one Milton L. Lieberman, trading as Lee Products and as Chemi-Culture Laboratories, Chicago, stipulated with the Federal Trade Commission that he would cease using the word "Periodic" or other similar connotation as a part of the trade designation of these products, or referring to the menstrual period in any way which might indicate that such preparations have predictable or reliable influence on that period. Further, he agreed to cease representing that either of the preparations is based on a well known formula that has been used successfully for such purpose; to cease using such designations as "XXX" or "triple strength" as indicative of the extra strength or unusual potency of such preparations, or employing the word "Laboratories" as a part of his trade name, until such time as he may actually own or operate a laboratory for his business. Lee also stipulated that in regard to any of his preparations containing a laxative, he would discontinue any advertisement which did not clearly reveal the potential danger in using such products in the presence of symptoms of appendicitis; as to any of his preparations containing apioi or pennyroyal, he agreed to discontinue any advertisements which did not disclose that the use of such products may produce irritation of the kidneys. It was provided, however, that if directions for use of each of such preparations, whether on the label or in the labeling, should contain specific and adequate warnings of its potential danger to health, such advertisements need bear only the warning, "Caution: Use Only as Directed."

Orjene Pure Shampoo, Vi-Vu Scalp Treatment, V-Kol and Couleur de Ton.—These are put out by the Orjene Company of New York. In a stipulation that it entered into with the Federal Trade Commission in November 1943, it agreed to cease representing that the shampoo is a cure or remedy for dandruff or is of any help in that condition beyond the removal of dandruff scales; that Vi-Vu will promote or restore a healthy growth of hair, remove local scalp irritations or renew life-giving nutrient; that V-Kol is a cure for itching scalp or skin, eczema or dandruff, or will aid nature in growing healthy hair. The respondent further agreed to discontinue any advertisement of Couleur de Ton which did not conspicuously reveal that the product contains ingredients which may cause skin irritation in certain individuals, and that the preliminary test outlined in the directions should first be made; that the product should not be used for dyeing the eyelashes or eyebrows, lest it cause blindness; provided, however, that it would be sufficient to advertise, "Caution: Use Only as Directed on Label" if such label should bear first-mentioned caution conspicuously and the accompanying labeling should give adequate directions for such preliminary testing before each application.

Presto Face Cream.—This is put out by T. L. Miller, trading as the T. L. Miller Manufacturing Company, New Orleans. In December 1943 he entered into a stipulation with the Federal Trade Commission, agreeing to cease representing that the use of this cosmetic will produce a clear, smooth skin or, by use of the word "Manufacturing" or similar words in its trade name or otherwise, that he owns or operates a company engaged in the business of manufacturing or compounding the preparation. Further, he agreed to discontinue any advertisement which represented that Presto Face Cream is safe to use, or failed to reveal that it should not be applied to an area of the skin larger than the face and neck at any one time; that too frequent applications or use over excessive periods of time should be avoided; that adequate rest periods between series of treatments should be observed; that the product should not be applied to areas where the skin is cut or broken, and that prior to its use a proper patch test should be made to determine whether the user is allergic or sensitive to the cream. It was provided, however, that such advertisements need only contain the statement: "Caution: Use Only as Directed" if the directions in the labeling carry a warning to the same effect.

Ultraviolet Ray Lamps.—In November 1943 Science Laboratories, Inc., and Sperti Electric Company, Inc., Cincinnati, entered into a stipulation with the Federal Trade Commission, agreeing to discontinue the following advertising misrepresentations for their models IC-77 and HI-41 lamps, or any of similar construction: That conditions of the modern age are such that the public is deprived of most of the benefits of sunlight or (by inference) that health depends on obtaining such radiation by artificial means; that the low death rate in summer as compared with the high death rate in winter is an index to the deficiency of ultraviolet light in winter; that the lamps offered for sale without adequate filter equipment produce ultraviolet rays, or that such radiation is comparable to sunshine. Further, they agreed to discontinue the misrepresentations that these lamps are indispensable for expectant or nursing mothers; that the lamps are an aid to skin health, or to a clear, unblemished complexion in general, or that their irradiation relieves all types of pains and aches or is an effective treatment or remedy for every variety of soreness and congestion.

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D.D.N.J. and foods, F.N.J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Gloria Laxative Pills, or Rx S368230 Pills.—Parke, Davis & Company, Detroit, manufacturer, and John A. Smith Company, Oconomowoc, Wis., distributor. Various shipments between Jan. 13, 1941, and July 14, 1942. Composition: aloin and an extract of cascara sagrada. Misbranded because labeling failed to give any directions for use or to warn that pills were not to be taken in the presence of abdominal pain, nausea, vomiting or other symptoms of appendicitis, and that frequent or continued use might result in dependence on laxatives. Further misbranded because label failed to give common or usual name of active ingredients, since "Cascara Bitter" is not the common or usual name of any substance.—[D.D.N.J., F.D.C. 761, September 1943.]

My-X-Ym.—My-X-Ym Food Enzymes Products, Chicago. Shipped March 2, 1942. Composition: essentially ground senna pods, powdered milk, yeast, wheat bran, cornstarch, cacao powder, soybean tissues and sugars including dextrose and sucrose. Misbranded because labeling failed to warn adequately that, as a laxative, the product should not be taken in cases of nausea, vomiting, abdominal pain or other symptoms of appendicitis, or that frequent or continued use of a laxative might establish a habit; also misbranded because label falsely represented and suggested that My-X-Ym was an enzyme product and, when used as directed, would balance the weight of the body, be efficacious "for health" and supply a factor whose absence would result in many ailments; would cause the glandular system to function properly and would restore energy and vigor; would detoxify the system and prove an adequate treatment for a long catalog of disorders, including allergic eczema, pancreatic indigestion, acidosis, colitis, gallbladder trouble, neuritis, obesity and hemorrhoids, and prevent catarrhal conditions in many parts of the body.—[D.D.N.J., F.D.C. 765, September 1943.]

Vita-Port Vitamin B₁ Tonic.—Seized in May 1942 when offered for sale by Super Cut Rate Drugs, Washington, D. C. Composition (claimed): "Each fluid ounce contains thiamin hydrochloride (Vitamin B₁) . . . 4 mg. (Equivalent to 1330 International units) Alcohol 20 Per cent. . . . Misbranded because label statements, "Here's Health! . . . Recommended for Underweight—Loss of Appetite Nervousness" were false and misleading, since the product would not be an effective treatment for such conditions.—[D.D.N.J., F.D.C. 787, September 1943.] Also declared misbranded under the provisions of the law applicable to foods, as reported in F.N.J. 3841.

Correspondence

RESEARCH IN THE SAN DIEGO ZOO

To the Editor:—In THE JOURNAL, July 8, page 729, is an item on the research center planned by the New York Zoo with the mention that the plan is "unique, . . . the first time any zoo has tried to collaborate with science." For the record would you please at some time note that there has been such a research hospital here for many years and that the New York authorities have been in communication with Mrs. Belle Benchley, in charge of the San Diego Zoo ("Life in a Man Made Jungle," "My Friends, the Apes") regarding the layout here.

We believe that this San Diego research institute has been unique. For many years any science worker whose project was approved by the committee could be assigned free laboratory space and the use of considerable equipment while his work progressed toward completion and publication, with whatever help he might ask from a committee of widely varied interests. For several years up until the war there were two research students who received a yearly fund for work applicable to zoo problems. Among workers who have published articles from this research institute are Dr. Jackson Kiser, Dr. Lawrence Penner, Dr. Robert Udall, Dr. Charles Schroeder, Dr. Leo Conti, Dr. George Kilgore, Dr. M. Wiener, Dr. F. D. McKinney, Dr. Jacob Traum, Dr. Joshua Bailey, Mr. Willys Doetschman and one of the founders, Dr. Harry Wegforth. A note in THE JOURNAL might be of interest to medical men who wish to do research and would be glad to avail themselves of our facilities.

RAWSON J. PICKARD, M.D., San Diego.

Chairman, Biological Research Institute of the Zoological Society of San Diego, Balboa Park.

TREATMENT OF HEMANGIOMAS

To the Editor:—In THE JOURNAL, August 5, Dr. Merlin T. R. Maynard discussed my communication (May 27, p. 302) in which I commented on the article by Dr. George V. Kulchar on the treatment of hemangiomas in his article on "Benign and Malignant Tumors of the Foot" (March 18, p. 761).

Dr. Maynard insists that all angiomas sensitive to radiation should be treated from the day they are discovered if they show any tendency to grow. I want to reassert that simple strawberry and cavernous angiomas, contrary to general dermatologic opinion, do not require any treatment for the reason I previously stated (May 27, p. 302). This will be the subject of an article to appear in the *Journal of Pediatrics*. I should like to call the attention of pediatricians and all other physicians who care for children to the article by W. A. Lister (The Natural History of Strawberry Naevi, *Lancet* 1:1429 [June 25] 1938) in which he relates that 93 strawberry and cavernous angiomas followed for a period of from one to seven years spontaneously involuted by the fifth year of life.

Dr. Maynard relates the case of a vascular lesion on the head of an infant, enlarging to the size of a grapefruit at the end of a year and requiring surgery because of hypertrophy of the heart. I cannot conceive, from a physiologic point of view, how a simple strawberry or cavernous angioma could produce a cardiac hypertrophy. If the vascular lesion actually was responsible for the cardiac hypertrophy, an arteriovenous aneurysm or communication must have been present and a bruit should have been detected on auscultation of the lesion.

C. RUSSELL ANDERSON, M.D., Los Angeles.

CANCER NOT ASCRIBED TO SINGLE INJURY

To the Editor:—There have been two recent editorials on Workmen's Compensation for Cancer Ascribed to Single Injury. The following quotation from C. A. Joll in Selected Papers for the Royal Cancer Hospital (Free), vol. 2, 1939-1940 is pertinent:

"Reliable evidence that a single trauma can produce in its train, early or late, a malignant tumor is entirely lacking, both experimentally and clinically. In my own twenty-five years' experience at the Royal Cancer Hospital and elsewhere, I have never seen a case of 'traumatic' cancer which on critical examination could be substantiated."

ISABELLA H. PERRY, M.D.,
Division of Pathology,
University of California Medical School,
San Francisco.

"FIRST INSTITUTION FOR EPILEPTIC"

To the Editor:—In the July 29 issue of THE JOURNAL at the foot of page 897 is an item entitled "First Institution for the Epileptic." Unless one was well acquainted with the institutional treatment of epileptic patients one might be misled by this article. In the first place "the first institution specifically for epileptics was established in Gallipolis, Ohio, in 1890 and opened in 1893." This statement is true as far as the United States is concerned. Much older institutions were established for the epileptic at Ghent, Belgium, and at Bielefeld, Germany, where I visited the Bethel colony in 1908. One of the earlier institutions established in our country was the State Hospital for Epileptics at Parsons, Kan., in 1903. I happen to be quite well acquainted with this institution in that I was assistant physician and assistant superintendent there from January 1904 for almost three years. The Kansas institution was the fourth institution established for the treatment of the epileptic in the United States, if my memory serves me correctly. This institution admits and treats sane and insane epileptic patients.

A. L. SKOOG, M.D., Kansas City, Mo.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES
Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Sept. 9, page 126.

NATIONAL BOARD OF MEDICAL EXAMINERS
NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Nov. 13-15. Part III. Various centers, September or October. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES
AMERICAN BOARD OF ANESTHESIOLOGY: Written, Part I. Various centers, Jan. 19. Final date for filing application is Oct. 21. Sec., Dr. P. M. Wood, 745 Fifth Ave., New York 22.

AMERICAN BOARD OF INTERNAL MEDICINE: February. Final date for filing application is Dec. 15. Asst. Sec., Dr. W. A. Werrell, 151 University Ave., Madison 5, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written, Part I. Various centers, Feb. 3. Sec., Dr. Paul Titus, 1015 Highland Blvd., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: Los Angeles, January. Final date for filing application is Oct. 1. New York, June. Chicago, Oct. 1945. Final date for filing application is Dec. 1. Sec., Dr. S. Judd Beach, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF OTOLARYNGOLOGY: Oral. Chicago, Oct. 47. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF RADIOLOGY: Oral. New York, April 14-15. Final date for filing application is Dec. 1. Sec., Dr. C. A. Altmann, 1157 First Ave., New York 17.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Oral. New York, December. Final date for filing application is Sept. 30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington 1, D. C.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Workman's Right to Procure Physician at Employer's Expense on Employer's Failure to Furnish Physician.—In the course of his employment, in May 1942 Caldwell sustained a low back sprain. Because he commuted from his home in New York City to his employer's plant in Bridgeport, Conn., the employer's first aid department instructed him to consult his family physician in New York City for necessary medical aid. The employer later paid compensation to the workman through Aug. 13, 1942, including the fees of Dr. Cohen, Caldwell's family physician. About the latter date the workman was sent to Bridgeport by his physician for further treatment by the employer's physician and was in turn discharged by him August 15 and sent home. Two weeks later the workman was unable to return to work in Bridgeport "because of pain and disability," and on August 18 he resumed treatments with Cohen. Cohen notified the employer of the facts and requested authority to treat the patient, but the employer made no reply until September 23, when a letter was received by Cohen stating that the workman had not yet been discharged by the employer's physician and that the employer disclaimed liability for Cohen's bill. Cohen nevertheless continued to render necessary care for the workman and eventually submitted a bill for \$163, which admittedly was reasonable. Later the workman instituted proceedings for compensation under the workmen's compensation act of Connecticut and was awarded compensation, including the amount of Cohen's bill, by the commissioner who heard the matter. The employer appealed to the superior court of Fairfield County, Conn., which remanded the case back to the commissioner for a finding as to whether or not there was expressed or implied authority given by the employer for the treatments or whether or not in view of the previous conduct of the parties the employer was estopped from denying that he had authorized Cohen to render the necessary treatment to the workman. The commissioner found an estoppel and the employer again appealed to the superior court, which vacated the award of compensation to the extent of Cohen's bill. The workman then appealed to the Supreme Court of Errors of Connecticut.

On the second appeal the trial court considered only the narrow question of estoppel. Much broader considerations, said the Supreme Court of Errors, were involved. The applicable part of the workmen's compensation act (General Statutes Act 5232) provides as follows:

The employer, as soon as he shall have knowledge of any such injury, shall provide a competent physician or surgeon to attend the injured employee, and in addition shall furnish such medical and surgical aid or hospital service as such physician or surgeon shall deem reasonable or necessary. In the event of the failure of the employer promptly to provide such . . . service, the injured employee may provide such . . . service at the expense of the employer

This was the basis of the original award. That award still stands, the commissioner merely adding certain further findings when the matter was referred back to him by the trial court. When the employee was unable to go to his work at Bridgeport and went back to his New York physician, that physician reported the need of treatment, yet the employer did nothing from August 18 to September 23. Under these circumstances the commissioner could properly consider that under the statute the employee was entitled to get treatment from his own doctor at the employer's expense. The liberality with which we treat the employee's rights under the statute, said the court, is apparent in *Bongialatti v. H. Wales Lums Co.*, 97 Conn. 548, 550, 117 A. 696, 697. In that case the medical bills were incurred before the employer had notice of the injury. Nevertheless the court said

If, in the absence of an immediate notice to the employer of the injury, he fails to provide medical aid, through ignorance of the injury or otherwise, and the employee employs medical aid, the employer is required to reimburse the employee for such expenditure if the same is reasonable as to amount and if the competency of the aid so employed is also reasonable so that the employer is not prejudiced thereby.

In the instant case, immediate notice was given, and the competency of the physician is not in question. See also *Thompson v. Towle*, 98 Conn. 738, 740, 120 A. 503; *Henderson v. Mazzotta*, 113 Conn. 747, 753, 157 A. 67. The underlying reason for the statute, sec. 5232, is stated in *Carney v. Plimpton Mfg. Co.*, 111 Conn. 401, 405, 150 A. 305, 307: it recognizes "the legislative idea that the employer as well as society benefit by the early restoration to health of the injured employee." The employer's appeal should have been dismissed.

Accordingly, the Supreme Court of Errors ordered, in effect, that the trial court dismiss the employer's appeal from the commissioner's award of compensation, which award included the physician's bill.—*Caldwell v. United States Aluminum Co.*, 38 A. (2d) 6 (Conn., 1944).

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 8-12. Dr. W. L. Benedict, 102 Second Ave. S.W., Rochester, Minn., Secretary.
- American Academy of Pediatrics, St. Louis, Nov. 9-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.
- American Hospital Association, Cleveland, Oct. 2-6. Mr. George P. Bugbee, 18 East Division St., Chicago, Executive Secretary.
- American Pediatric Society, Atlantic City, N. J., Sept. 25-27. Dr. Hugh McCulloch, 325 N. Euclid Ave., St. Louis 8, Secretary.
- American Public Health Association, New York, Oct. 3-5. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, Executive Secretary.
- American Roentgen Ray Society, Chicago, Sept. 24-29. Dr. H. Dabney Kerr, University Hospitals, Iowa City, Secretary.
- Association of American Medical Colleges, Detroit, Oct. 23-25. Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary.
- Association of Military Surgeons of the United States, New York, Nov. 2-4. Col. James M. Phalen, Army Medical Museum, Washington 25, D. C., Secretary.
- Colorado State Medical Society, Denver, Sept. 27-29. Dr. John S. Bouslog, 537 Republic Bldg., Denver 2, Secretary.
- District of Columbia, Medical Society of the, Washington, Oct. 5-7. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.
- Indiana State Medical Association, Indianapolis, Oct. 3-5. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis 4, Executive Secretary.
- Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 17-20. Dr. Arthur G. Sullivan, 16 N. Carroll St., Madison, Wis., Managing Director.
- International College of Surgeons, U. S. Chapter, Philadelphia, Oct. 3-5. Dr. Desiderio Roman, 250 South 17th St., Philadelphia, Secretary.
- Kansas City Southwest Clinical Society, Kansas City, Mo., Oct. 2-4. Dr. William M. Korth, 1115 Grand Ave., Kansas City 6, Mo., Secretary.
- Kentucky State Medical Association, Lexington, September 18-20. Dr. P. E. Blackerby, 620 S. Third St., Louisville, Secretary.
- Michigan State Medical Society, Grand Rapids, Sept. 27-29. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Secretary.
- Midwestern Section of American Federation for Clinical Research, Chicago, Nov. 2. Dr. Richard H. Lyons, University Hospital, Ann Arbor, Mich., Secretary.
- Mississippi Valley Medical Society, Peoria, Ill., Sept. 27-28. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.
- Oklahoma City Clinical Society, Oklahoma City, Oct. 23-26. Dr. L. C. McHenry, 512 Medical Arts Bldg., Oklahoma City, Secretary.
- Omaha Mid West Clinical Society, Omaha, Nebraska, Oct. 23-27. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha 2, Secretary.
- Pennsylvania, Medical Society of the State of, Pittsburgh, Sept. 19-21. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh 22, Secretary.
- Radiological Society of North America, Chicago, Sept. 24-29. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Virginia, Medical Society of, Richmond, Oct. 23-25. Miss Agnes V. Edwards, 1200 E. Clay St., Richmond 19, Secretary.
- Wisconsin, State Medical Society of, Milwaukee, Sept. 18-20. Mr. Charles H. Crownhart, 110 E. Main St., Madison 3, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

14:253-306 (May) 1944

- Myasthenia Gravis: Report of 2 Cases with Necropsy Findings. A. S. Giordano and J. L. Haymond.—p. 253.
 *Pathologic Findings in Nerve and Muscle in Poliomyelitis. W. B. Dublin, B. A. Bede and B. A. Brown.—p. 266.
 Phenol Studies: VII. Chronic Phenol Poisoning, with Special Reference to Effects on Experimental Animal of Inhalation of Phenol Vapor. W. B. Deichmann, K. V. Kitzmiller and S. Witherup.—p. 273.
 Influence of Purified Diets on Toxicity of Promin. G. M. Higgins.—p. 278.
 Jaundice in Amyloidosis of Liver. D. M. Spain and R. L. Riley.—p. 284.
 Postmortem Studies in Mental Patients: Frequent Findings in Paranoid States. O. J. Pollak.—p. 289.
 Carcinoid Tumors of Ileum (Argentaffinomas). C. E. McLeod.—p. 301.

Nerves and Muscles in Poliomyelitis.—Dublin and his co-workers studied biopsy specimens of muscle from 3 patients with poliomyelitis with the method of Ranvier. A boy aged 6 years, who was considered to have anterior poliomyelitis of nonparalytic type and to show "spasm" and "alienation," was studied by biopsy thirty-five days after the onset of symptoms. A youth aged 18 years with a moderate degree of paralytic weakness was studied by biopsy forty days after the onset of symptoms. A girl aged 12 years with severe flaccid paralysis was studied by biopsy forty-eight days after the onset of symptoms. Degeneration of nerve fibers, motor end plates and muscle fibers was seen in degree commensurate with the degree of paralysis. The irregularity of distribution was in keeping with the irregularity of distribution of injury to nerve cells of the gray matter of the spinal cord. Degeneration of nerve fibers consisted largely of failure to stain axons together with preservation of cellular elements of capsules of motor endings and of sheaths of Schwann. Atrophy of muscle fibers appeared in the form of pyknosis introduced by loss of cross striations and increase of longitudinal markings. Degeneration of nerve and muscle probably was secondary to injury to nerve cells of the spinal cord.

American J. Digestive Diseases, Fort Wayne, Ind.

11:173-204 (June) 1944

- *Inhibition of Peptic Activity in Treatment of Peptic Ulcer. F. Steigmann and A. R. Marks.—p. 173.
 Vitamins and Hormones in Nutrition. B. F. Sieve.—p. 179.
 Changes in Sensitivity to Allergenic Foods in Arthritis. J. A. Turnbull.—p. 182.
 Role of Fat Soluble Vitamins A and D in Nutrition. J. Buckstein.—p. 190.
 Hypoglycemic Reaction with Convulsions in Ascariasis (Case Report). L. L. Frank.—p. 195.
 Regional Enteritis. J. R. Phillips.—p. 197.

Inhibition of Peptic Activity in Peptic Ulcer.—Steigmann and Marks carried out the following procedures on patients admitted to Cook County Hospital with diagnosis of peptic ulcers: A Rehfuess tube was introduced into the stomach of the fasting patient, and an attempt was made to aspirate the entire gastric contents. With the tube in situ the patient ate four Unceda crackers and drank one glass (200 cc.) of water. Samples of gastric juice were aspirated every fifteen minutes for two hours. The pH and peptic activity were determined in each of the specimens. On succeeding days the same procedure was repeated but the patient received, shortly after taking the crackers and water, either (a) one capsule (100 mg.) of sodium lauryl sulfate, (b) two capsules of sodium lauryl sulfate, (c) 2 Gm. of calcium carbonate, (d) 8 cc. of an aluminum hydroxide preparation or (e) two tablets of a magnesium hydroxide compound. Each patient was tested on five successive days. A

similar group of patients were given the usual ulcer diet plus one capsule of sodium lauryl sulfate every hour for twelve hours or more, depending on the patient's symptoms. These patients were observed during their stay in the hospital and later as outpatients. The authors found that calcium carbonate and aluminum hydroxide preparations, magnesium hydroxide and sodium lauryl sulfate caused decreased peptic activity simultaneously with a rise in the pH . Calcium carbonate, the aluminum hydroxide preparation and magnesium hydroxide caused more pronounced peptic inhibition than sodium lauryl sulfate. The authors were unable to confirm the reported observation that sodium lauryl sulfate inhibits peptic activity in the presence of an unaltered pH . Clinical use of sodium lauryl sulfate in a small number of patients on the usual dietary peptic ulcer management failed to reveal any superiority of this medication over some of the other medications used.

American Journal of Diseases of Children, Chicago

67:429-534 (June) 1944

- Initial Stabilization of Diabetic Child. J. M. Brush.—p. 429.
 *Erythroblastosis Fetalis: Proposed Definition and Clarification of Term. Madge Thurlow Macklin.—p. 445.
 Oral Moniliasis in Newborn Infants. Nina A. Anderson, Dorothy S. Sage and E. H. Spaulding.—p. 450.
 *Atelectasis Complicating Acute Poliomyelitis, with Involvement of Respiratory Muscles. M. Cooperstock.—p. 457.
 Roentgenograms of Chest Taken During Pertussis. J. L. Kohn, I. Schwartz, J. Greenbaum and Mary M. I. Daly.—p. 463.
 Levinson Ratio and Tryptophan Test: Comparative Value in Diagnosis of Tuberculous Meningitis. F. A. Kriete, H. C. Epstein and J. A. Toomey.—p. 469.
 Prophylactic Value of Sulfathiazole Against Neonatal Gonococcal Conjunctivitis. M. Gleich, M. L. Blumberg and A. S. Mason Jr.—p. 472.
 Comparison of Westergren and Kato Erythrocyte Sedimentation Rate Readings: Relation to Clinical Status of Children with Rheumatic Fever. J. B. McKinley and R. L. Jackson.—p. 474.

Erythroblastosis Fetalis: Clarification of Term.—Macklin defines erythroblastosis as a condition in which the blood of the fetus exhibits immature cells of the erythrocytic series which are not normal, either as to type or as to quantity, for the stage of development of the fetus. This condition may be elicited by numerous factors, may or may not be accompanied with hemolysis and may or may not be accompanied with extramedullary hemopoiesis. It includes hemolytic disease of the newborn as well as erythroblastosis due to factors other than hemolysis. When it is due to an antigen-antibody reaction there will be hemolysis with accumulation of iron in the fetal liver, and there will usually be persistent extramedullary hemopoiesis. This form of erythroblastosis is hemolytic disease of the newborn. In the majority of instances the hemolysis appears to be due to the Rh factor complex. Factors such as anoxemia cause erythroblastosis, as here defined, but not hemolysis. If they begin to operate early in development, extramedullary hemopoiesis will persist; if they begin just before term, formation of blood may be restricted to the bone marrow. A tentative explanation of the failure to find antibodies in the blood of the mothers of some fetuses showing erythroblastosis is advanced. It is based on a supposed immaturity of the antigen as it exists in the immature red cell, with a corresponding specificity of the antibody for this particular antigen. At present the demonstration of the antibody depends on its reaction with the antigen as it exists in the mature red cell. Testing of the blood of the mother with that of the fetus may demonstrate the presence of such antibodies. Another possible explanation is based on the recently discovered fact that there are at least six different Rh factors. Preparations of only the two commoner types of antigen are employed in the usual tests.

Atelectasis Complicating Acute Poliomyelitis.—According to Cooperstock a number of factors predispose to the development of atelectasis in paralysis of the respiratory muscles due to poliomyelitis. Foremost among them is the reduction of vital capacity. Also important is the fact that the ability to cough is impaired in poliomyelitis. Failure to rid the bronchial airways of exudate leads to bronchial occlusion and atelectasis. Should the obstructing material contain infective agents, as it invariably does, the situation is then fertile for the development of secondary pneumonia. It is thus apparent that in poliomyelitis with paralysis of the respiratory muscles there exists a constant threat of the development of grave pulmonary complications. For a patient already encumbered with serious disabilities

the advent of such complications may well spell disaster. It is therefore of interest to record 4 instances, in 3 of which unexpected recovery took place. In all 4 atelectasis developed after the acute phase of the disease had passed, the pulmonary complications occurring from three weeks to one year after the admission of the patient to the hospital. Three of the patients were still in the respirator, and for the fourth patient the use of the respirator had been discontinued only four days prior to the occurrence of atelectasis. The patients had extensive paralysis of all extremities in addition to involvement of the muscles of respiration. The favorable outcome in the 3 patients who recovered followed the occurrence of a critical clinical picture due to the development of secondary pneumonia. Recovery appeared to depend on the favorable effect of sulfonamide compounds on the pneumonic process, permitting ultimate spontaneous clearing of the atelectasis. In the prophylaxis against pulmonary complications, avoidance of exposure to infections of the respiratory tract is of utmost importance. With the occurrence of such infections the early institution of chemotherapy may be effective in preventing the development of more serious complications. The continued use of the mechanical respirator under such circumstances is essential. Although not employed in the cases reported here, the early use of bronchoscopy for the relief of bronchial occlusion may minimize pulmonary complications under such circumstances. It is of interest that in patients already so seriously handicapped by poliomyelitis spontaneous clearing of atelectasis is possible.

American Review of Soviet Medicine, New York

1:389-480 (June) 1944

Medical Organization for Military Offensive. A. Georgevski, Y. Krichevski and B. Gorski.—p. 389.

*Tick Borne Encephalitis. A. A. Smorodintsev.—p. 400.

Acute Primary Hemorrhagic Meningoencephalitis. M. S. Margulis, V. D. Soloviev and A. K. Shubladze.—p. 409.

Psychologic Changes in Tick Borne or Spring-Summer Encephalitis. Ida B. Galant.—p. 428.

Modern Data on Frostbite. S. S. Girkolav.—p. 437.

Retrograde Changes in Spinal Cord in Frostbite of Extremities. D. I. Panchenko.—p. 440.

Uses of Greases and Ointments in Prevention of Frostbite. F. G. Krotkov.—p. 443.

Intravenous Injections by Drip Method in Treatment of Shock. A. F. Lepikahn.—p. 447.

Comparative Value of Three Blood Substitutes. I. P. Petrov, P. N. Veselkin, M. L. Dernovskaya and T. E. Petkun.—p. 450.

Tick Borne Encephalitis.—Smorodintsev reviews the work done in Russia on isolation of the virus causing tick borne or spring-summer encephalitis. The disease is characterized by an incubation period of eight to eighteen days, a temperature rise to 100.4 to 104 F., violent headache, pain in the nape of the neck, vertigo and vomiting. The predominant physical signs are meningismus and focal lesions of the central nervous system rapidly followed by paralysis of the limbs, neck and back. In some cases an ascending paralysis involves the cervical segments of the spinal cord, reaching the medulla, to develop bulbar palsy associated with dyspnea, cardiac arrhythmia, dysphagia and aphonia. The mortality rate ranges from 20 to 30 per cent. Death usually occurs between the third and the eighth day. Many convalescents are physically disabled by paralysis and atrophy of the cervical muscles and shoulder girdle. The patients who recover do not display Parkinson's syndrome occurring in von Economo's lethargic encephalitis. Spring-summer encephalitis in the European part of Russia takes a milder course, with a mortality rate of only 10 per cent. The histopathology of spring-summer encephalitis is characterized by intense inflammatory and degenerative changes of the nervous systems. The pia mater of both brain and spinal cord is always involved. The disease may be classified as an acute nonsuppurative meningoencephalopolyomyelitis. An acute serous exudate appears on the meninges, and the brain is softened and congested, while numerous hemorrhages appear on the brain stem, the medulla, and in the horns of the spinal cord. The causative agent is a virus which passes through the finest Berkefeld and Chamberland filters. It belongs to type B of seasonal encephalitis. The virus cannot be neutralized by the serums of patients recovered from the lethargic Economo encephalitis. It also differs from the St. Louis virus in its antigenic and immunogenic properties. According to recent observations by

Casals, spring-summer encephalitis virus bears a close relationship to louping ill virus through complement fixation, neutralization and intraperitoneal cross resistance tests. Intracerebral cross resistance tests, on the other hand, were negative. Neither spring-summer encephalitis nor louping ill virus appeared to be related to the viruses of Japanese, St. Louis and West Nile types of encephalitis. Tick borne encephalitis is distinctly seasonal. It begins at the end of April and assumes epidemic proportions in May. Prior to May and after August there occur only sporadic cases. Moderate atmospheric temperature and relatively high humidity favor the development of the disease. The greatest incidence and mortality occur in new settlements situated in slightly cultivated forests. The clinical and epidemiologic characteristics of tick borne spring-summer encephalitis distinguish it from the Japanese and the St. Louis types, which are most prevalent during the dry, hot months of August and September. The authors list epidemiologic and experimental data that indicate transmission of the disease through ticks, especially *Ixodes persulcatus*. The transmission of the virus can be traced from infested larvae and nymphs to rodents or birds, which in turn transmit the virus to larvae and nymphs, thus completing the cycle. Every new animal species, including man, entering the forests is exposed to encephalitis. The possibility of producing artificial immunity in men is supported by the fact that convalescence from encephalitis is linked with a lasting immunity. There are prospects for the prophylaxis and treatment of encephalitis by serums obtained from convalescent or hyperimmunized animals. Serotherapy of encephalitis was studied in the endemic areas during the last five years. The serums obtained from convalescents or hyperimmunized horses produced favorable results in a number of cases when intraspinal injection of 10 to 15 cc. was supplemented with intramuscular injection of 30 to 50 cc. of serum. Immediate intramuscular injection of 40 to 50 cc. of serum is indicated for persons bitten by ticks in the endemic areas.

Archives of Neurology and Psychiatry, Chicago

51:501-596 (June) 1944

Sweat Secretion in Man: VI. Spinal Reflex Sweating. C. F. List and A. D. Pimenta.—p. 501.

*Effects of Variations in Intracranial Pressure. A. J. Kahn.—p. 508.

Suppression of Motor Response in Man. H. W. Garol and P. C. Bucy.—p. 528.

Abscess within Spinal Cord: Review of Literature and Report of 3 Cases. P. K. Arzt.—p. 533.

Psychic Deafness in Children. E. Froeschels.—p. 544.

Prolonged Insulin Coma in Treatment of Schizophrenia. T. D. Rivers and H. P. Rome.—p. 550.

Fatal Circulatory Failure Caused by Electric Shock Therapy. H. W. Jetter.—p. 557.

Racial and Sexual Incidence of Primary Intracranial Tumors: Statistical Study of 133 Cases Verified by Autopsy. H. P. Newbill and G. C. Anderson.—p. 564.

Use of Furmethide in Testing Sweat Secretion in Man. S. A. Guttman.—p. 568.

Colloid Cyst of Third Ventricle. E. W. Shannon.—p. 570.

Effects of Variations in Intracranial Pressure.—In the first part of this study Kahn is concerned with the effect of raised intracranial pressure on consciousness, which he studied in dogs. Distilled water was perfused into the anatomic central end of the common carotid artery, and observations were made on whether or not this procedure would render the animal comatose. Kymographic records were simultaneously taken of the respiration, the general carotid blood pressure, the cerebrospinal fluid pressure in the cisterna magna and the pressure in the brain tissue (intracerebral pressure). It was at first assumed that the pressure in the lateral ventricles was being accurately recorded by measurement of the cisternal pressure. The fallacy of this assumption was later demonstrated by some chance measurements of the intraventricular pressure. In subsequent experiments the intraventricular pressure was simultaneously recorded with a mercury manometer. Perfusion of distilled water into the anatomic central end of the common carotid artery resulted in elevation of the intracerebral and intraventricular pressures to levels above the cisternal pressure. When the intracerebral and the intraventricular pressure approached the level of the diastolic blood pressure, dire respiratory and circulatory effects were produced, ending in the death of the animal. Respiration first became labored and then stopped, and circulatory failure was preceded by pronounced

slowing of the pulse (heart rate) and terminal hypertension in 50 per cent of the experiments. The experiments reported in the second part of this paper were undertaken to study the mechanism involved in the production of these effects on respiration and circulation. It was found that the respiratory and circulatory embarrassment associated with high levels of intraventricular and intracerebral pressure could be relieved by ventricular drainage, which sharply lowered both the intraventricular and the intracerebral pressure. No circulatory or respiratory embarrassment occurred when both the cisternal and the intraventricular pressure were at high levels, but medullary embarrassment appeared soon after the cisternal pressure was lowered, the intraventricular pressure alone remaining high. In animals in which the intraventricular pressure was abruptly raised while measures were taken to keep the cisternal pressure low, the general tendency was toward a distinct slowing in heart rate. The hemodynamic effects in these experiments were not constant, the general tendency being toward a decrease in the blood pressure. The respiratory depression and the circulatory effects resulting from these abrupt increases in intraventricular pressure were eliminated by raising the cisternal pressure or by lowering the intraventricular pressure. The ill effects of increased intraventricular pressure are due to herniation of the medulla into the foramen magnum. This herniation was experimentally observed in dogs. The possibility also exists that the respiratory and circulatory effects were due to a herniation of the mesencephalon through the incisura tentorii. The fallacy of the cisternal pressure being regarded as a measure of the intraventricular and the intracerebral pressure when cerebral edema and/or the possibility of internal hydrocephalus exists receives emphasis from the results of the water perfusion experiments. In internal hydrocephalus consequent to severe cranial trauma, use of lumbar puncture as a means of relief of intracranial tension is invalid and contraindicated. Ventricular drainage is indicated for such a condition. Ventricular drainage, together with artificial respiration and administration of isotonic solution of three chlorides (infused into the central end of the common carotid artery), was efficacious in restoring respiration and increasing the blood pressure after severe medullary trauma in the water perfusion experiments.

Archives of Physical Therapy, Chicago

25:321-384 (June) 1944

- Medicolegal Aspects of Physical Medicine. H. H. Buckelew.—p. 327.
Resuscitation of the Drowned Today. F. C. Eve.—p. 332.
Rationale for Electrodiagnosis and Electrical Stimulation in Denervated Muscle. S. L. Osborne, F. S. Grodins, E. Mittelman, W. S. Milne and A. C. Ivy.—p. 338.
*Induced Resistance to Prolonged Sun Exposure. J. L. Rudd.—p. 345.
*Psychobiologic Factors in Kenny Concept of Infantile Paralysis. C. Bohnengel.—p. 350.
Present Status of Ultraviolet Blood Irradiation (Knott Technique). G. Miley.—p. 357.

Induced Resistance to Prolonged Sun Exposure.—Rudd investigated whether sunburn and its complications might be prevented by the use of small graduated doses of artificial ultraviolet radiation by the mercury vapor quartz lamp. He describes 3 cases as examples of the reaction to solar radiation after a series of hot quartz lamp applications of ultraviolet radiation. He stresses that such protection is particularly important to the person with light, tender skin or with any other form of sensitivity to solar radiant energy. If large numbers of service men needed this protection, mass treatments could be given with little cost or loss of time from duty.

Bulletin of Johns Hopkins Hospital, Baltimore

74:229-274 (April) 1944

- Significance of Electrocardiographic Abnormalities in Young Adults. Caroline Bedell Thomas.—p. 229.
Congenital Chickenpox with Disseminated Visceral Lesions. Ella H. Oppenheimer.—p. 240.
*Observations on Histidine Deficient Diet in Man. A. A. Albanese, L. E. Holt Jr., Jane E. Frankston and Virginia Irby.—p. 251.
Proper Attention to Role of Emotional and Social Factors in Illness as New Step in Public Health. G. C. Robinson.—p. 259.

Histidine Deficient Diet in Man.—Albanese and his collaborators studied the human requirement for histidine in 3 normal adult males submitted to an experimental diet consisting of fats, starches and certain fruits and vegetables of low

protein content which provided approximately 10 per cent of the daily nitrogen intake. The remaining 90 per cent was supplied as a histidine deficient casein digest. None of the three subjects developed clinical symptoms or changes in their blood chemistry or morphology. They all lost weight. The nitrogen balance remained positive throughout, and the excretion of histidine in the urine showed no reduction. The histidine deficient state was characterized by the appearance of an abnormal metabolite in the urine, a substance giving a green reaction with the Sharlit indican test. The results indicate that histidine is not essential for the maintenance of nitrogen equilibrium in the adult human being. The authors hesitate to conclude that histidine is unessential for man until further studies have clarified the picture. The loss of weight remains to be explained. The abnormal metabolite in urine in the histidine deficient period does not provide evidence of the essentiality of histidine. Apart from the question of the essentiality of the histidine for the adult is the question of the need of the growing organism for this amino acid.

Georgia Medical Association Journal, Atlanta

33:167-200 (June) 1944

- *Pneumoperitoneum: Form of Compression Therapy in Treatment of Pulmonary Tuberculosis; Review of 154 Cases. H. E. Crow.—p. 167.
Madura Foot: Report of Youngest Case on Record. D. R. Venable and J. H. Gaston.—p. 174.
Treatment of Thrombophlebitis. C. E. Rushin.—p. 178.
Importance of Rectal Examinations. A. M. Phillips.—p. 183.
Treatment of Hemorrhoids. H. H. Askew.—p. 186.

Pneumoperitoneum in Treatment of Pulmonary Tuberculosis.—Crow reports 154 cases treated at the Georgia State Tuberculosis Sanatorium between August 1937 and June 1942. Pneumoperitoneum with consequent elevation of the diaphragm produces partial and often optimum compression of one or both lungs. Temporary phrenic nerve interruption prior to inducing pneumoperitoneum aids in securing greater elevation of the diaphragm. The majority, namely 122 of the 154 cases, were far advanced with a poor or hopeless outlook. There were 26 deaths during the treatment, 47 patients discontinued the treatment after a few refills and some could not be reached. Of the 77 cases in which treatments were continued, 10 were unimproved, 41 were improved and 26 were quiescent. Exudative lesions, particularly those in the middle third of the lung, showed the greatest amount of response. The effects on the lung and pleurae from pneumoperitoneum are much less likely to result in serious complications than are those of pneumothorax. A well established pneumoperitoneum will not reduce the apicobasal diameter of the lung more than 40 to 60 per cent and the total volume from 50 to 65 per cent, but the remaining partially inflated portion of the lung above the paralyzed hemidiaphragm is well splinted and the pressure against it is practically constant. The paralyzed hemidiaphragm, once it is well elevated, almost always remains practically stationary, regardless of the position of the patient.

Journal of International College of Surgeons, Chicago

7:171-256 (May-June) 1944

- Activities of Veterans Administration. F. T. Hines.—p. 171.
Anesthesia in War Surgery. F. Graña.—p. 175.
Present Treatment of Wounds and Burns. R. Hayden.—p. 179.
Surgeons and Events. M. Thorek.—p. 191.
*Blast Injuries. B. W. Hogan.—p. 193.
Mediastinal Wounds Caused by Explosives. E. Erkul.—p. 200.
Electrosurgical Treatment of Carcinoma of Rectum. A. H. Roffo and F. F. Carranza.—p. 202.
Transplantation of Omentum in Closure of Cerebrospinal Fluid Fistula. F. Mandl.—p. 219.
Generalization of Spinal Anesthesia. D. F. Fierro.—p. 221.
Occurrence of Pseudotumors in Synovial Membrane of Knee Joint. H. Milwidsky.—p. 227.
Hypernephroid Tumor of Right Kidney, with Metastatic Lesion in Right Scapula. C. E. Nagel.—p. 235.
Acute Cholecystitis. F. S. Mainzer.—p. 241.

Blast Injuries.—Hogan discusses some observations on 35 cases of blast injuries admitted to the hospital after Pearl Harbor. He recommends conservative treatment but states that recent perforation, gangrene of a segment of bowel and abscess formation demand surgical intervention. "War neurosis" and psychotic interludes have been attributed to exposure to explosions. Optic injuries, corneal and retinal hemorrhage, retinal

separation and presence of exudates have all been attributed to the effect of "blast" but have never been seen in animal experimentation. Injury to the ears is common. Underwater concussion may cause hemorrhage within any of the sinuses, sphenoidal as well as malar and frontal. Apparently injury to these sinuses may be of such violence as to fracture the bone. Fractures are supposedly due to the violent displacement of the limbs against some hard object rather than due to blast per se. Since the blast wave falls off in intensity very rapidly, every effort should be made to swim as far away from a source of concussion as possible, even a few yards theoretically constituting the difference between safety and fatal injury. The intensity of the concussion wave generated by explosions in air is greatly diminished in depressions, trenches and foxholes, so that "hitting the dirt" is a protection from blast as well as from the resulting shrapnel.

Journal of the Mount Sinai Hospital, New York

11:1-64 (May-June) 1944

William Henry Welch Lectures: I. Studies on Dehepatized Animal; Review. F. C. Mann.—p. 1.

*Effect of Certain Quinones, Aldehydes and Ketones on Blood Pressure of Hypertensive Mammals. B. S. Oppenheimer, S. Soloway and B. E. Lowenstein.—p. 23.

Essays on Biology of Disease. E. Moschcowitz.—p. 29.

Massive Pulmonary Embolism: I. Based in Part on Study of 88 Fatal Cases. H. Neuhof and S. H. Klein.—p. 32.

Life's Later Years: Studies in Medical History of Old Age. F. D. Zeman.—p. 45.

Effect of Quinones, Aldehydes and Ketones on Blood Pressure.—According to Oppenheimer and his associates there are five quinones which have more or less antipressor properties when tested on hypertensive mammals. These are (1) sodium rhodizonate, (2) sodium thymoquinone sulfonate, (3) sodium beta-naphthoquinone-4-sulfonate, (4) 2,6-dichloroquinone and (5) 2-methyl-alpha-naphthoquinone. The first three of these proved to be toxic when tested on hypertensive dogs. Oral administration of sodium beta-naphthoquinone-4-sulfonate to 3 hypertensive dogs was ineffective. A search among the dialdehydes and diketones for effective antipressors on hypertensive rats and dogs has yielded one promising lead in 1,4-cyclohexanedione. In the doses employed so far, 1,4-cyclohexanedione has not produced toxic effects. Further studies are now in progress.

Journal of Nutrition, Philadelphia

27:435-522 (June) 1944

Study of Riboflavin and Thiamine Requirements of Children of Preschool Age. Helen Oldham, Frances Johnston, Sarah Kleiger and H. Hedderich-Arismendi.—p. 435.

Vitamin Interrelationships: III. Influence of Suboptimum Doses of Thiamine on Urinary Excretions of Riboflavin. B. Sure.—p. 447.

Associative Dynamic Effects of Protein, Carbohydrate and Fat. E. B. Forbes and R. W. Swift, with technical collaboration of Ann Greenwood Buckman, Jane E. Schopfer and Mary T. Davenport.—p. 453.

Bioassay of Vitamin E. Gladys A. Emerson and H. M. Evans.—p. 469.

Congenital Malformations Induced in Rats by Maternal Nutritional Deficiency: VI. Preventive Factor. J. Warkany and Elizabeth Schraffenberger.—p. 477.

Absence of Rapid Deterioration in Men Doing Hard Physical Work on a Restricted Intake of Vitamins of B Complex. A. Keys, A. Henschel, H. L. Taylor, O. Mickelsen and J. Brozek.—p. 485.

*Dietary Protein and Physical Fitness in Temperate and Hot Environments. G. C. Pitts, F. C. Consolazio and R. E. Johnson, with technical assistance of J. Poulin, A. Razoyk and J. Stachelek.—p. 497.

Studies on Comparative Nutritive Value of Fats: IV. Negative Effect of Different Fats on Fertility and Lactation in Rat. H. J. Deuel Jr., E. Movitt and Lois F. Hallman, with the technical assistance of Evelyn Brown.—p. 509.

Dietary Protein and Physical Fitness in Temperate and Hot Environment.—According to Pitts and his associates recommendations for the daily protein intake of men who are doing hard physical work have ranged from 50 to 165 Gm. The present figure given by the National Research Council of 70 Gm. daily represents a compromise. For men working in hot environments recommendations are commonly made that protein intake be restricted on the ground that its high specific dynamic action imposes an unnecessary load on the heat dissipating mechanisms of the body. However, men who are accustomed to working in the heat prefer a diet containing liberal quantities of meat. Good examples are harvesters, miners and baseball players. The authors made a study of subjects

subsisting on three levels of protein intake. Particular attention was paid to the subject's physical fitness for work in temperate and in hot environments. Three subjects were studied under both temperate and tropical conditions while reclining, standing and marching. The urinary nitrogen excretion in grams per day averaged 18.5 during the high protein period, 9.5 during the low protein period and 12.9 and 13.5 during the normal periods before and after the experiment, respectively. There were minor changes in body weight, with a maximum during the high protein period. The plasma protein level showed no significant changes. Physical fitness under temperate conditions showed no changes attributable to dietary protein level. Performance of work in both hot dry and hot moist environments showed no changes attributable to dietary protein level. In both cases, however, improvements due to training and acclimatization were observed. Metabolism while reclining and while standing was not significantly different in the high and low protein periods. Metabolism while marching was slightly lower in the low protein period. However, this was a physiologically insignificant change. It is concluded that, even though protein does have a high specific dynamic action, *the theoretical objections heretofore raised against a high protein diet in hot environments are unjustified.* Protein intake may vary widely from 75 to 150 Gm. daily without effect on performance of intermittent work in the heat.

Journal of Pediatrics, St. Louis

24:603-730 (June) 1944

Comparison of Newborn Infants with Erythroblastosis Fetalis with Those Born to Diabetic Mothers. H. C. Miller, R. D. Johnson and S. H. Durlacher.—p. 603.

Prescribed Diets for Normal Children. J. D. Boyd.—p. 616.

Promin in Treatment of Tuberculous Meningitis. W. J. Morrow, H. C. Epstein and J. A. Toomey.—p. 623.

Respiratory Shift in Epigastric Abdominal Wall—Physical Sign Seen with Complete Unilateral Paralysis of Diaphragm in Infants and Children. J. S. Light.—p. 627.

Automatic Nervous System Imbalance of Whole Gastrointestinal Tract in Newborn Infant. G. N. Krost.—p. 635.

*Development of Antibody Following Vaccination of Infants and Children Against Pneumococci. H. L. Hodes, J. F. Ziegler Jr. and Helen D. Zepp.—p. 641.

Gonorrheal Peritonitis in Children. D. L. Maguire Jr.—p. 650.

Purulent Pericarditis Complicating Pneumonia: Recovery in an Infant Following Therapeutic Aspiration and Development of Pneumopericardium. M. Cooperstock.—p. 656.

Rheumatic Pericarditis in Early Childhood. S. L. Ellenberg and H. Cook.—p. 662.

Whooping Cough Mortality. M. J. Fox and Elizabeth M. Knott.—p. 671.

Fulminating Meningococcemia (Waterhouse-Friderichsen Syndrome): Report of 3 Cases with Autopsy and 1 with Recovery. M. H. Strick.—p. 675.

Sedimentation Rate and White Blood Count in Acute Poliomyelitis. S. Rosin, W. P. Frank and P. M. Hamilton.—p. 679.

Role of Surgical Mask in Prevention of Cross Infections in Hospital Nurseries for Newborn Infants. H. Abramson.—p. 684.

Medical Social Work in Epidemic of Poliomyelitis. Alice A. Grant.—p. 691.

Development of Antibody Following Vaccination Against Pneumococci.—Hodes and his collaborators studied the production of pneumococcus mouse protective antibodies in the serum of a number of infants and children following vaccination with heat killed type I and type VI pneumococci. Most of the subjects were given the vaccine by intradermal inoculation. In a small group type I vaccine was administered by inhalation of a fine mist sprayed from a nebulizer. The patients were children admitted to the Harriet Lane Home or to Sydenham Hospital in Baltimore. The group was made up in part of children who had recently recovered from an acute infection and in part of those admitted to the hospital for study of some neurologic or metabolic disorder. The ages of the children varied from 2 weeks to 13 years. Among children over 2 years of age intradermal inoculation of a dose of heat killed type I pneumococci which did not cause systemic reactions or serious local reactions was followed in nearly every instance by an abrupt rise in serum mouse protective antibody titer. The level of antibody attained appears to be of the same order of magnitude as has been reported in adults following type I pneumococcus pneumonia treated with sulfonamides. The rise in antibody titer following vaccination persisted for at least several months. With few exceptions no rise in antibody titer following intradermal vaccination with type I pneumococci was

demonstrated among infants under 2 years of age. Inhalation by children over 2 years of age of a spray of killed type I pneumococci was followed in a few instances by a significant rise in mouse protective antibody titer. However, this method of vaccination was unreliable and cumbersome. Intradermal vaccination with type VI pneumococcus vaccine yielded equivocal results. Among children over 2 years of age a high pre-vaccination titer of mouse protective antibody against type VI pneumococcus was found much more often than against type I pneumococci.

Journal Pharmacology & Exper. Therap., Baltimore

81:101-208 (June) 1944

Treatment of Experimental Renal Hypertension with Renal Extracts. G. E. Wakerlin, C. A. Johnson, W. G. Moss and M. L. Goldberg.—p. 101.

Adrenolytic and Sympatholytic Actions of Yohimbine and Ethyl Yohimbine. F. F. Yonkman, D. Stilwell and R. Jeremias.—p. 111.

Toxicologic Studies of Phthalylsulfathiazole. P. A. Mattis, W. M. Benson and E. S. Koelle, with technical assistance of Ethel Williams and S. E. McKinney.—p. 116.

Inhibitory Effect of Sulfonamides on Action of Nicotine in Isolated Intestine. E. P. Pick, G. W. Brooks and K. Unna.—p. 133.

Toxicity and Trepanicidal Activity of Amide-Substituted Phenyl Arsenoxides and Their Derivatives. H. Eagle, R. B. Hogan, G. O. Doak and H. G. Steinman.—p. 142.

Pharmacology and Chemistry of Substances with Cardiac Activity: III. Effect of Simple Unsaturated Lactones and *t*-Butyl Hydrogen Peroxide on Isolated Frog Heart. R. Mendez.—p. 151.

Plasma Concentrations Following Oral Administration of Single Doses of Principal Alkaloids of Cinchona Bark. E. P. Hiatt.—p. 160.

Studies on Shock Induced by Hemorrhage: VII. Destruction of Cozymase and Alloxazine Adenine Dinucleotide in Tissues During Shock. Margaret E. Greig.—p. 164.

Antispasmodic Activity of Some 4-Morpholinealkyl Esters: I. Toxicity, Isolated Smooth Muscle Effects and Spasmodic Activity on Ileum of Anesthetized Dogs. H. F. Chase, A. J. Lehman and F. F. Yonkman.—p. 174.

Comparative Anoxic Effects from Carbon Monoxide Hemoglobin and Methemoglobin. D. Lester and L. A. Greenberg.—p. 182.

Chemotherapy of Filariasis in Cotton Rat by Administration of Neostom and of Neostibosan. J. T. Colbertson and H. M. Rose.—p. 189.

Relationship of Chemical Structure of Sympathomimetic Amines to Ventricular Tachycardia During Cyclopropane Anesthesia. O. S. Orth, J. W. Stutzman and W. J. Meek.—p. 197.

Evaluation of Influence of Succinate and Malonate on Barbiturate Hypnosis. K. H. Beyer and A. R. Latven.—p. 203.

Maine Medical Association Journal, Portland

35:81-106 (May) 1944

Tabulated Report of 8 Bacterial Endocarditis Cases. C. W. Steele and J. Gottlieb.—p. 81.

35:107-134 (June) 1944

Preserve Present System of Medical Care. A. H. Scolten.—p. 107.

Medicine, Baltimore

23:105-214 (May) 1944

Neurofibromatosis (von Recklinghausen) and Osteitis Fibrosa Cystica Localisata et Disseminata (von Recklinghausen): Study of Common Pathogenesis of Both Diseases; Differentiation Between "Hyperparathyroidism with Generalized Decalcification and Fibrocystic Changes of Skeleton and Osteitis Fibrosa Cystica Disseminata." S. J. Thannhauser.—p. 105.

Filariasis Due to Wuchereria Bancrofti. L. E. Napier.—p. 149.

Meningeal and Vascular Syphilis of Spinal Cord. R. D. Adams and H. H. Merritt.—p. 181.

New England Journal of Medicine, Boston

230:749-784 (June 22) 1944

Management of Blood Bank at Massachusetts Memorial Hospitals: New Problem of Rh Typing. F. E. Barton.—p. 749.

Functional Vomiting as Interpreted by Auscultation of Abdomen. N. C. Stevens.—p. 753.

Practical Details in Management of Sterility, with Special Reference to Endocrine Factors. S. R. Meaker, C. H. Lawrence and S. N. Vose.—p. 755.

Boston Medical Library. H. R. Viets.—p. 760.

Liver Intoxication. C. M. Jones.—p. 766.

230:785-818 (June 29) 1944

Perforated Peptic Ulcer: Follow-Up Study of 100 Cases. A. C. Williams.—p. 785.

Poliomyelitis on Isthmus of Panama. C. E. Taylor.—p. 790.

X-Ray Therapy of Heart in Patient with Leukemia, Heart Block and Hypertension: Report of Case. H. Blotner and M. C. Sosman.—p. 793.

Spontaneous, Threatened and Habitual Abortion: Their Pathogenesis and Treatment. A. T. Hertig and R. G. Livingstone.—p. 797.

New Jersey Medical Society Journal, Trenton

41:221-262 (June) 1944

Common Disorders of Digestive Tract: Clinical and Roentgenologic Study of Additional 500 Private Cases. S. W. Johnsen.—p. 226.
Vincent's Angina—Public Menace. C. V. Craster.—p. 230.
Venereal Disease Control in Industry. G. S. Usher.—p. 234.
Analysis of 100 Puerperal Deaths in Essex County. A. Meulim.—p. 23

New York State Journal of Medicine, New York

44:1281-1390 (June 15) 1944

*Measures to Prevent and Control an Epidemic of Ringworm of Scalp. G. M. Lewis, S. H. Silvers, A. C. Cipollaro, E. Muskatlitz and H. H. Mitchell.—p. 1327.

Measures to Control an Epidemic of Ringworm of Scalp.—Lewis and his associates state that an epidemic of *Microsporum audouinii* in New York City caused by *Microsporum audouinii* involving several thousand children has been spreading for more than a year. The report of a school nurse in this district regarding an unusually large number of children with infected scalps induced the district health officer to establish a diagnostic center to find the extent of the infection, to assist in diagnosis and to advise practitioners. All known infected children were asked to come to the diagnostic center for examination. They were examined under the filtered ultraviolet rays, a culture was taken and clinical records were kept. All child contacts were examined. New cases were soon found. The past treatment was appraised and, if unsatisfactory, the physician was told of the advantages of referring the patient to a skin clinic or to a dermatologist for the special care required. Each case was followed up by the diagnostic center until cured. Follow-up treatment had to be instituted in cases in which the x-ray epilation was incomplete. Absence from school became a problem, because it involved several hundred children in the district. Special classes formed for infected children functioned to the satisfaction of the children, the parents and the school and health authorities. After the patient was considered cured, two consecutive negative examinations by the diagnostic center, a week apart, were required before the child could return to school. Follow-up examinations were made at intervals of from two weeks to three months. Over a period of a little more than a year 432 children with *Microsporum audouinii* were registered at the diagnostic center. Of these, 411 had an infection with *M. audouinii*. By April 1, 1944 362 of these were known to be cured, while 70 cases were still active. New cases have decreased considerably. The authors make recommendations on measures to control the epidemic in New York City. The health department should lead by declaring the disease reportable, surveying all schools periodically, setting up diagnostic clinics in districts where the disease is prevalent and disseminating information to the general public. Filtered ultraviolet rays (Wood light) are essential in case finding and in determining when cure has taken place. Infections caused by *M. audouinii* should promptly receive the benefit of x-ray therapy.

War Medicine, Chicago

5:267-348 (May) 1944

*Emotional Albuminuria. J. H. Ahronheim.—p. 267.
The Guardhouse Inmate, with Brief Discussion of Psychopathic Personality. W. Rottersman.—p. 271.

Strain of Right Rectus Muscle Simulating Acute Appendicitis. E. D. Babbage, C. W. McLaughlin Jr. and R. L. Fruin.—p. 280.

Canadian Army Night Vision Training and Testing Unit. D. McEachern and B. D. R. Layton, and E. G. Burr.—p. 283.

Aedes Scutellaris Hebrideus Edwards: A Probable Vector of Dengue in New Hebrides. R. H. Daggy.—p. 292.

Complications of Scabies. L. Goldman.—p. 294.

Sanitary Control and Operation of Swimming Pools. M. Lieber.—p. 297.

Hyperventilation Syndrome in Flying Personnel. R. F. Rushmer and D. D. Bond.—p. 302.

*Migraine-like Syndrome Complicating Decompression Sickness. G. I. Engel, J. P. Webb, E. B. Ferris Jr., J. Romano, H. Ryder and M. A. Blankenhorn.—p. 304.

Emotional Albuminuria.—Ahronheim noted that applicants for training as air cadets who after withdrawal of blood for a Kahn test had fainted or had felt faint almost invariably had considerable amounts of protein in the urine although a specimen of urine obtained prior to the withdrawal of blood had been free of albumin in a good percentage of cases. The regularity with which this phenomenon appeared in such persons as well as the increase in albumin in the second specimen following

a first specimen containing albumin suggested a relationship between the emotional upset precipitating fainting and the presence of protein in the urine. In order to substantiate this conception, the author made investigations on 1,000 young men between the ages of 17 and 26 who seemed to be perfectly healthy. Two specimens of urine were obtained during a period of about fifteen minutes, the second voiding being preceded by withdrawal of blood for a Kahn test. Only 446 of the 1,000 men gave negative reactions for albumin in both specimens; the other 554 men had positive reactions in one or both specimens, and in 504 of these albuminuria appeared after withdrawal of blood for the Kahn test. Of the 127 men who had fainted, only 3 had negative reactions in both specimens. The author thinks that the albuminuria was precipitated by emotional factors. There was no relationship between emotional albuminuria and the Schneider index. The intensity of albuminuria decreases with advancing age. Albuminuria in apparently healthy persons with a normal history is insignificant. It is possible that emotional albuminuria may be utilized as a test for emotional instability.

Migraine-like Syndrome Complicating Decompression Sickness.—According to Engel and his co-workers visual disturbances are common among subjects experiencing decompression sickness during exposure to simulated high altitudes in a decompression chamber. Blurring of vision or scotomas are usually followed by headache. This report is based on a series of 1,361 exposures of 155 subjects to simulated altitudes of 30,000 to 38,000 feet. Seventeen subjects experienced scotomas a total of 46 times; 36 instances occurred in 971 exposures at 35,000 feet, 9 in 383 exposures at 38,000 feet and 1 in an exposure at 30,000 feet. Anoxia was not present. It is apparent that these symptoms occurred repeatedly in some persons and not at all in others. The reaction always occurred after decompression sickness had developed, but it was unrelated to altitude; most often it developed five to thirty minutes after descent, but when it developed at altitude its course was uninfluenced by remaining at altitude or by descent. Although complicated by syncopal symptoms in some instances, the reaction was not related to syncope. Visual field studies revealed that the scotomas were homonymous, that they shifted rapidly in position, always moving peripherally, and that they were sometimes multiple. Headache, which was always contralateral to the scotomas, began when the scotomas had disappeared and was sometimes associated with nausea and vomiting. Electroencephalograms during two reactions revealed focal abnormalities in the cortex corresponding to the focal neurologic signs. The close similarity of the reaction to clinical migraine led the authors to inquire into the past history of migraine among the 115 subjects. A highly significant incidence of migraine headaches was found among the subjects susceptible to the reaction. These visual disturbances obviously represent a hazard during flying and landing operations. The fact that scotomas may exist for some time before the subject becomes aware of them and the frequency with which they seem to develop during descent suggest the possibility that they may be potentially responsible for landing accidents. Two steps would greatly decrease the incidence of those reactions among flying personnel engaged in high altitude work: (1) adequate preselection to eliminate persons susceptible to decompression sickness and (2) elimination of candidates with a history of clinical migraine unless their susceptibility to decompression sickness is low.

Wisconsin Medical Journal, Madison

43:603-644 (June) 1944

- Upper Urinary Tract Problems in Infants and Children. N. W. Bourne.—p. 603.
Experiences with Parenteral Use of Amino Acids. A. R. Curreri and O. V. Hibma.—p. 609.
Importance of Early Recognition of Congenital Dislocation of Hip. V. C. Turner.—p. 613.
Cancer of Bowel: Some Remarks on Diagnosis and Treatment. C. F. Dixon.—p. 618.
Diabetes in Pregnancy. G. S. Kilkenny.—p. 622.

43:665-764 (July) 1944

- Present Status of Hemorrhagic Diseases. F. W. Madison.—p. 688.
Inaccuracy of Pelvic Examinations. E. F. Mielke.—p. 693.
Heart in Pregnancy and Labor. W. C. Danforth.—p. 698.
Faulty Posture in Children. D. J. Ansell.—p. 703.
Electroencephalography in Children. M. G. Peterman.—p. 708.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British J. Children's Diseases, Dorking, England

41:31-70 (April-June) 1944

- *Meningitis in Children Refractory to Sulfonamides. R. Gross-Heisler and E. Davis.—p. 31.
*Pathogenesis and Clinical Symptoms of Tuberculous Meningitis. S. Engel.—p. 34.

Meningitis in Children Refractory to Sulfonamides.—Gross-Heisler and Davis point out that an impression prevails that treatment of meningitis other than tuberculous has been revolutionized by the sulfonamides. They describe 6 refractory cases they saw in the course of the last eighteen months. The ages of the children ranged from 3 months to 7 years. Two of the 6 patients had adrenal hemorrhage, and 1 of them fell into the category of the so-called Friderichsen-Waterhouse syndrome. Four patients with streptococcal and staphylococcal meningitis died despite intensive therapy with various sulfonamides. It is suggested that as soon as penicillin becomes available it should be used for such cases.

Pathogenesis and Clinical Symptoms of Tuberculous Meningitis.—According to Engel, tuberculous meningitis occurs most frequently in young children, and often in the first few months after the primary infection. Macroglandular caseation may pave the way for the secondary spread. The route of infection does not run directly from the primary complex to the meninges via the blood stream. The brain and plexuses in 13 cases of tuberculous meningitis in children have been investigated. Cortical foci and tuberculomas could not be found. Choroid plexus changes were present in every instance, but they were of a peculiar nature and not typical tubercles. The changes of the choroid plexuses suggest that they infect easily the ventricular fluid; they are numerous although minute by themselves but more likely to infect the fluid than solid tubercles or large caseous masses. Giant cells and caseation were present in advanced cases. Usually it is the final stage that presents itself at necropsy, but the author was able to observe a case in the initial stage. In spite of the early stage of the meningeal process the choroid plexuses showed the typical changes, but tubercle bacilli were abundant this time, contrary to the former findings. The choroid plexuses, it seems, breed initially an enormous number of bacilli, which drop from the decaying villi into the ventricular fluid and proceed from there through the natural communications to the basal spaces, thus producing basal meningitis. Tuberculous meningitis cannot be considered as an isolated occurrence in tuberculosis; it is always part of milary tuberculosis. The author emphasizes that the so-called classic picture of tuberculous meningitis applies only to a minority of cases among young children. In children of school age it is more frequent. It is advisable to use the dermographia test in doubtful cases, which is usually intense in cases of brain pressure.

Journal of Endocrinology, London

3:323-410 (May) 1944

- Staining Basophil Cells of Human Hypophysis, with Special Reference to Abnormal Basophil Cells of Cushing's Syndrome. N. G. B. McLetchie.—p. 323.
*Pituitary Basophilism Syndrome of Harvey Cushing. N. G. B. McLetchie.—p. 332.
Carcinoma of Adrenocortical Rest Associated with Hypophysial Abnormality. N. G. B. McLetchie and L. D. W. Scott.—p. 347.
Disturbances of Water Balance in Rat on Removal of Adrenal Medulla. L. Stein and E. Wertheimer.—p. 356.
Nature of Hyperossification Observed in Long Bones of Rats Treated with Excessive Doses of Estradiol Benzoate. H. N. Lippman and J. B. de C. M. Saunders.—p. 370.
Production of Ovulation in Immature Rat. I. W. Rowlands.—p. 384.
Additional Studies of Extrathyroidal Metabolism of Iodine. A. Chapman, G. M. Higgins and F. C. Mann.—p. 392.
Ateleiotic Dwarfism with Normal Sexual Function: Result of Hypopituitarism. T. F. Hewer.—p. 397.
Observations on Estrogenic Potency of Stilbestrol in Guinea Pig. P. Baesch and G. M. Wyburn.—p. 401.

Cushing's Pituitary Basophilism.—McLetchie reports the history of a man aged 32 who presented symptoms indicative of Cushing's syndrome. Necropsy revealed that here the pituitary basophilism was not associated with hypophysial, adrenal

or thymic tumor and that there was no adrenal hyperplasia. The abnormalities present in the anterior pituitary were (1) a conspicuous degree of basophil cell hyalinization, (2) an excessive degree of basophil cell vacuolation, (3) multifocal basophil cell vacuolation in the individual cells associated with excessive disappearance of granules and with the revelation of a refractile cytoplasmic envelop surrounding the vacuoles (cobweb vacuolation), (4) nuclei of the basophil cells normal but in many cells cobweb vacuolation associated with displacement of the nuclei to the periphery of the cells and with compression and scalloping of the nucleus by the vacuoles with numerous binucleate basophil cells, (5) the basophil cells increased in size and (6) the acidophil cells greatly reduced in size. These findings are contrasted with those in 2 other cases of basophilism, with those in nonbasophilism cases and with those of other recorded descriptions of the abnormal basophil cells of basophilism. The author stresses that the abnormalities of size and vacuolation found in the chromophil cells are (1) inconstant in basophilism and (2) not associated with a particular pathologic type of basophilism. The cobweb vacuolation and nuclear scalloping in the basophil cells is similar to what Severinghaus and others have interpreted as nuclear "blistering." It is suggested that the abnormalities of size and vacuolation in the chromophil cells represent a phase of reaction to hypogonadism and are of only secondary importance in the morbid process of basophilism. The author briefly discusses the correlation between the different pathologic types of basophilism. He also directs attention to the relation of the morbid process of Cushing's syndrome to the changes produced in rats fed on a diet containing a high proportion of *Brassica* seeds. He thinks that basophil cell hyperactivity is the essential abnormality of Cushing's syndrome and that basophil cell hyalinization is a cytoplasmic change resulting from hyperactivity.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

51:85-180 (April) 1944

- *Some Recent Studies and Investigations in Sterility. A. Sharman.—p. 85.
Pattern of Contractions of Pregnant Uterus Under Spinal Anesthesia and the Attendant Changes in Reactivity of Myometrium. P. Malpas.—p. 112.
Occurrence and Significance of *Clostridium Welchii* in Female Genital Tract. R. Salm.—p. 121.
Case of Osteomalacia in Pregnancy. H. R. MacLennan.—p. 127.
Postclimatic Kyphosis. G. Bierer.—p. 130.
*Hogben Pregnancy Test with Note on Breeding of *Xenopus* for Test. F. W. Landgrebe and L. Sampson.—p. 133.
Trichlorethylene and Midwifery. W. Clavert.—p. 140.
Amyoplasia Congenita Causing Malpresentation of Fetus. Mildred I. Ealing.—p. 144.
Primary Melanosarcoma of Vagina: Case Report. Y. M. Broberg and A. Brzezinski.—p. 147.
Self Retraction of Uterus After Portes Operation. H. Hofmann.—p. 150.

Investigations on Sterility.—Sharman discusses certain selected aspects of sterility, namely (1) the estimation of tubal patency, (2) anovular menstruation as assessed by endometrial biopsy, (3) endometrial tuberculosis, (4) the causation of tubal occlusion, (5) seminal analysis and (6) the results obtained by a follow-up investigation. The observations are based on a consecutive and unselected series of 500 cases of primary sterility which have been followed up for several years and a number of more recent cases which have been the subject of particularized research. Estimation of tubal patency was done on 480 women, of whom about half had two or more insufflations. Insufflation revealed nonpatency in 38 per cent of the cases. Of 358 patients in whom biopsy was performed premenstrually, 6.4 per cent exhibited anovular cycles. Of 392 patients in whom biopsy was performed, 5.1 per cent showed unsuspected tuberculous endometritis. Seminal examination of 114 husbands revealed normal characters in 68.4 per cent, pronounced deficiency in 13.2 per cent and azoospermia in 18.4 per cent. Of 409 cases traced, pregnancy occurred in 116, i. e. 28.3 per cent. Pregnancy did not occur where anovular cycles or endometrial tuberculosis or azoospermia was present (with the exception of 2 cases of anovular cycles after treatment). In 152 of 293 sterile marriages infertility factors were found that would render pregnancy impossible or unlikely. The author thinks that if a greater number of cases had had endometrial biopsy and seminal examination performed there is little doubt that the infertility factors

of anovular cycles, tuberculous endometritis and azoospermia would have appreciably reduced the figure of 141 cases in which as far as investigation went, no reason was discovered for the infertility of the marriage. His studies on tubal patency by means of insufflation on a series of 1,063 revealed that true nonpatency exists in from 25 to 30 per cent of cases of primary sterility. The percentage of error in insufflation and in hysterosalpingography is about equal, but the error in the former is reliance on a single test, which error can be avoided by repeating the test, whereas the error in hysterosalpingography is in the reading of the plates and is not always remediable. In a further 491 consecutive and unselected cases of primary sterility 27 (5.5 per cent) have shown unsuspected endometrial tuberculosis. This gives a total incidence of 5.3 per cent in 883 cases. In cases in which gross tubal damage is not present, tubal occlusion is rarely due to gonococcal salpingitis or to congenital hypoplasia. Evidence is produced to show that blockage in a considerable number of cases is due to subclinical tuberculous salpingitis.

Hogben Pregnancy Test; Breeding of *Xenopus*.—According to Landgrebe and Sampson the South African clawed toad *Xenopus laevis* was first introduced as an assay animal by Hogben in 1930, who observed ovulation of *Xenopus* after injection of anterior pituitary lobe extract. The authors describe their experiences with the Hogben test. Of a total of 258 tests they were able to check 220 against ultimate clinical observations, and of these 218 were found correct. The 2 exceptions were patients with menopausal symptoms. The authors emphasize that the Hogben test for pregnancy, using the Scott technique for extraction of the urine, is as reliable as any other test, provided at least ten days elapse since the first missed period. Menopausal urines extracted by precipitation technique often give a positive Hogben test in the absence of pregnancy, but with the Scott extraction method the test gives a negative result in these cases and also gave a negative result in 2 pregnant patients showing menopausal symptoms at the time of the test. The Hogben test is more rapid and requires much smaller demands on laboratory routine than other tests. At 22 C. a result is obtained within eighteen hours, and the animals require feeding and cleaning only once a week. The test is much less expensive than the Friedman or the Aschheim-Zondek in both food and animal costs. Two toads are sufficient for each test if they are in good condition. Each toad was used over twenty-four times and still respond satisfactorily. Laboratory bred *Xenopus* toads can be used for the test and are capable of producing a second generation which will also respond to pregnancy urine extracts.

Transactions Royal Soc. Trop. Med. and Hyg., London

37:347-452 (May) 1944

- *Heat Effects in British Service Personnel in Iraq. T. C. Morton.—p. 347.
Lizard Filariasis: Experimental Study. T. B. Menon, B. Ramamurti and D. S. Rao.—p. 373.
Portal Cirrhosis in Iraq. R. S. Stacey.—p. 387.
Lobar Pneumonia in African Soldiers. T. Simpson.—p. 399.
Kala-Azar in East Africa. A. C. E. Cole.—p. 409.
Cutaneous Leishmaniasis in Nigeria. B. G. T. Elmes and R. N. Hall.—p. 437.
Abdominal Pain in Diagnosis of Early Kala-Azar. E. Burke.—p. 441.
Unusual Case of Kala-Azar Successfully Treated with Stilbamidine. M. A. Shellim.—p. 447.
Asthma Produced by *Ascaris* Infestation. K. V. Earle.—p. 451.

Heat Effects in British Service Personnel in Iraq.—Morton divides heat effects into heat syncope, heat exhaustion and heat hyperpyrexia, because the clinical picture is as a rule clearcut and the prognosis and treatment are radically different. Syncope occurs in temperate climates, in hot stuffy atmospheres and also in heavily overlaid soldiers on the march. It is a temporary cardiovascular collapse which, like other faints, may progress to severe prostration with giddiness, a small soft fluttering pulse, shallow breathing, dilated pupils, a cold skin and subnormal temperature. The patient is bathed with a cold clammy sweat, and severe headache and mental confusion may follow. Death may occur in cases of heart disease. Treatment consists in dorsal decubitus in a cool place, the loosening of tight clothing and the bathing of the face with cold water together with the application of ammonia to the nostrils and a small dose of sal volatile. Electrolytic imbalance and dehydration

tion appear to be of primary importance in the genesis of heat exhaustion. The lean, spare type with a low systolic pressure is particularly prone to heat exhaustion. The quantitative estimation of the urinary chlorides is a simple and reliable test in the differential diagnosis of these cases, and sodium chloride and glucose are a safe and effective remedy. If intravenous therapy is indicated, this must be controlled by charting the intake and output and estimating the hemoconcentration; otherwise there is a risk of pulmonary edema. The prognosis in heat exhaustion is excellent, provided the condition is recognized in time and adequately treated. Heat hyperpyrexia is always a grave syndrome: the mortality is usually at least 30 per cent and may be considerably more. Alcohol and age are accessory and adverse factors, and the condition is more frequent in the fat and plethoric. The essential factor is the failure of the heat regulating center with the suppression of sweating, although in the more protracted cases it is probable that an autointoxication is responsible for the prolonged pyrexia. Thermantidote measures and the nursing of these patients in artificially cooled wards are the basis of treatment. Ample cool drinking water containing 10 grains (0.65 Gm.) of sodium chloride to the pint, together with a total consumption of at least 1 ounce (30 Gm.) of sodium chloride a day is a paramount necessity in all endemic areas during the hot weather. The provision of air conditioned or artificially cooled wards in hospitals in endemic areas is essential.

Helvetica Medica Acta, Basel

11:1-334 (April) 1944. Partial Index

- Diabetic Glomerulosclerosis. O. Spühler.—p. 27.
Clinical Aspects of Malignant Nephrosclerosis. F. Wulfrum.—p. 31.
Elimination of Sulfathiazole in Renal Insufficiency. M. Demole and P. Guye.—p. 39.
Rudimentary Infarct of Anterior Wall as an Acute Process. M. Holzmänn.—p. 47.
Gastrointestinal Ulcers and Coronary Syndromes. R. Junet.—p. 75.
*Spinal Varicosities. E. Uehlinger and O. Gsell.—p. 85.
Frequent Occurrence of Temporary Eosinophilic Pulmonary Infiltrates. F. Leutenegger.—p. 111.
Cutaneous Tests with Ascarides Extract in Temporary Eosinophilic Pulmonary Infiltrates. E. Zweifel.—p. 117.
Pulmonary Function in Silicosis. E. Jéquier-Doge and M. Lob.—p. 123.
Cirrhosis of Liver and Central Nervous System. E. Martin, G. de Morsier and P. Alphonse.—p. 141.
Quinine and Bone Marrow. J. P. Chapuis and G. Hemmeler.—p. 195.
New Investigation on Iron Metabolism: Variations in Iron Content of Serum During Course of Day. G. Hemmeler.—p. 201.
Pathology and Therapy of Nonspecific Inflammatory Arterial Diseases. A. von Albertini.—p. 233.
Thrombosis of Internal Carotid Artery and Its Relation to Endangiitis Obliterans of Winiwarter-Buerger. H. Krayenbühl and G. Weber.—p. 289.

Spinal Varicosities.—According to Uehlinger and Gsell, dilatation and serpentinization of the veins of the spinal cord may cause changes in the medulla and irritation of nerve roots. Clinically it becomes manifest in two syndromes: (1) as an apoplectic form and (2) as a neuralgic paralytic form. The authors describe 2 cases observed by them during the past year. The first belonged to the group of juvenile apoplexy. The patient, who died at the age of 28, had a first apoplectic attack after a scare at the age of 18 and a second fatal stroke ten years later, both from complete well-being. The first acute spinal apoplexy resulted in flaccid tetraplegia, singultus, priapism, impairment of voluntary urination and defecation and in disturbance of sensibility. Meningitic symptoms were absent. The clinical course was that of a typical hematomyelia in the lower cervical cord with perforation of the hemorrhage into the subarachnoid space. The paralytic symptoms commenced to regress after a few hours. The attack terminated in complete restoration of motility and sensibility of the left arm and the legs, but in the right arm and shoulder region an atrophic paresis remained. After an interval of ten years a second spinal apoplexy suddenly developed. The attack was followed by death within ninety minutes. There was pulmonary edema but again no loss of consciousness. Necropsy explained both attacks as acute hematomyelia, originating in a varicose network on the cervical spinal cord. Whereas the first attack had destroyed only some segments of the right lower cervical spinal cord, in the second attack the hemorrhage extended upward and downward with perforation into the ventricle and the central canal of the spinal cord. The second patient, a man aged 48, experi-

enced acute pain in the lumbar region which developed into a syndrome of radicular sciatic neuritis first unilaterally and later bilaterally; death was caused by transverse lumbar myelitis. Necropsy disclosed spinal varicosities near the cauda. Spinal varicosities may be a partial manifestation of a status varicosus or it may be limited to the spinal cord. The condition is more frequent in the male than in the female, as was demonstrated by Globus and Doshay in 1929. The apoplectic form usually appears earlier in life than the neuralgic paralytic form. The presence of extraspinal varicosities, such as varicose veins or hemorrhoids, may be of help in the diagnosis. Laminectomy with spinal decompression may lead to the arrest or even the regression of the symptoms of spinal varicosities. Observations so far do not indicate resection of the spinal varicosities, since the effect of this intervention cannot be foreseen.

Schweizerische medizinische Wochenschrift, Basel

73:989-1012 (Aug. 14) 1943. Partial Index

- *Nephrotic Hypertension Syndrome in Diabetes and Kimmelstiel's and Wilson's Inter-capillary Glomerulosclerosis. M. Auroi.—p. 989.
Castellani's Bronchospirochotosis: Case. S. Moeschlin.—p. 995.
Atrophy of Left Kidney Due to Ascending Venous Thrombosis: Case. A. Müller.—p. 998.
Study of Loss of Tendon Reflexes in Lower Extremities in Course of Cerebral Tumors. M. Schachter.—p. 999.
Toxicity of Sulfonamides and Vitamin B₁. A. Fleisch and T. de Preux.—p. 1001.
Anesthesia of Short Duration Induced with 1-Methyl-5,5-Allyl-Iso-propyl-Barbiturate Sodium ("Narconumal Roche"). G. Reimann-Hunziker.—p. 1003.

Nephrotic Hypertension Syndrome in Diabetes and Kimmelstiel's and Wilson's Inter-capillary Glomerulosclerosis.—Auroi describes 4 cases of women 64, 54, 45 and 60 years of age with diabetes, presenting Kimmelstiel's and Wilson's nephrotic hypertension syndrome. The condition in these and in similar cases described in literature is anatomically characterized by a peculiar primary independent hyalinization of the glomeruli. It may remain clinically latent, or albuminuria, arterial hypertension with its sequels in the circulatory apparatus and renal insufficiency, i. e. the common picture of glomerular disease may be presented, depending on the degree and extent of the lesions. The nephrotic syndrome (hypo-proteinemia and edema) should be considered coordinated or subordinated to the glomerular process, in correspondence to the findings in diffuse glomerulonephritis with nephrotic type of edema. Diabetes associated with advanced age may safely be assumed to be the etiologic factor. There were only a few exceptional cases in which the intracapillary glomerulosclerosis was not associated with diabetes. Latent diabetes, however, or aglycosuric diabetes resulting from an increase in the renal threshold was probably present in those instances. A masked diabetes should be watched for in individuals of advanced age presenting the nephrotic hypertension syndrome. The finding of intracapillary glomerulosclerosis at necropsy strongly suggests the premortal presence of diabetes. The course of the fully developed intracapillary glomerulosclerosis is rapid, and death from cardiac insufficiency, uremia or apoplexy will occur within two to three years.

Revista de la Policlínica Caracas, Caracas

13:93-156 (March-April) 1944. Partial Index

- *Therapy of Parkinson's Syndrome by Vitamin B₆ (Pyridoxine). A. Sanabria and L. A. Muro.—p. 125.

Vitamin B₆ Therapy of Parkinsonism.—Sanabria and Muro administered vitamin B₆ to 11 patients with parkinsonism. The drug was given intravenously on ten consecutive days in daily doses of 50 mg. The treatment was continued after the ten days only on patients who improved during its administration. It was given intravenously every other day in doses of 50 mg. and also by mouth in 10 mg. doses on the days on which the drug was not injected. By the end of the treatment tremor was almost completely controlled, and muscular rigidity and muscle tone were greatly improved in 4 cases. Walking was regained in 1 of the 4 cases. Tremor alone was controlled in 1 case. No effect from the treatment was observed in 6 cases. Sialorrhea was not affected in any case. Best results were obtained in early cases. The fact that the drug is expensive makes its use less available than that of the alkaloids of belladonna.

Book Notices

Clinical Tropical Medicine. By Twenty-Seven Authors. Edited by Z. Taylor Bercovitz, M.D., Ph.D., F.A.C.P., Assistant Clinical Professor, New York Post-Graduate Medical School, Columbia University, New York. With foreword by Wilbur A. Sawyer, M.D., Director, International Health Division, Rockefeller Foundation, New York. Cloth. Price, \$14. Pp. 957, with 141 illustrations. New York & London: Paul B. Hoeber, Inc., 1944.

This attractive volume is a useful addition for any medical library. It is handsomely printed, and there is an agreeable and rare paucity of typographic errors. The form is monographic and the authors' list includes many accepted authorities such as C. F. Craig, Lee Foshay, Howard Fox, A. W. Grace, A. V. Hardy, G. W. McCoy, K. F. Meyer, Morris Moore, Henry Pinkerton, J. F. Siler, F. L. Soper, E. B. Vedder and W. H. Wright, to mention only some.

The volume is too large for easy handling, and its values are spotty. It might have been improved by condensation of certain subjects such as rabies, psittacosis and tularemia, and by omission of such subjects as poliomyelitis, smallpox, varicella, typhoid, epidemic encephalitis and trachoma. A few sections could well be amplified and brought up to date. In the latter group are the short, almost fragmentary sections on personal hygiene and sanitation in the tropics, where specific recommendations would be of more value than trite generalizations. Mosquito control is barely mentioned in this section. Acclimatization, environmental effects of geography and social climate and medical geography are not discussed and hardly clearly mentioned. Yet on these will depend much of what mankind accomplishes in the future in regions of warm climate. Problems of housing, food supply and future transport and communications could have their medical groundwork laid now, and this would have been within the field of a monographic review of tropical medicine.

More in detail the following comments occur to the reader. The discussion of sprue, beriberi, pellagra and scurvy by E. B. Vedder is splendid. It is preceded by a clear, comprehensive and up to date description of the vitamins. Outside of trichina, filaria and schistosomes, helminths are well covered as to epidemiology, prevention and treatment. Trichinosis is poorly covered, especially in respect of subclinical infection, epidemiology, geography, animal sources, digestion of biopsy material and suspected meat, and prophylaxis by refrigeration. The space allotted to *Wuchereria bancrofti* is far less than that for trichinosis. This section is poor, as is also the sketchy review of schistosomes.

While the biology and diagnosis of amebiasis are discussed at length, the bacteriologic diagnosis of bacillary dysentery is only mentioned and not described. The review of treatment of bacillary dysentery is sketchy and incomplete without critical comparison of sulfonamide drugs. The paragraph on transfusion could better have been omitted. The special diet list and instructions are redundant, unnecessary and inaccurate, while the advice on bacteriophage is equivocal. In fact, the section on the treatment of bacillary dysentery is poor and not up to the level of most chapters in the book.

The discussion of cholera by Joseph F. Siler is unusually satisfactory. Malarial sections in general are diffuse, not clear, often inexact and ambiguous, and the presentation of distribution is quite inadequate. Reference is made to Sir Andrew Balfour as if he were still alive in Khartoum. In connection with the differentiation of malaria and kala azar, it is scarcely correct to say that it is by microscopic examination of the blood alone. Some odd spellings have slipped by, as "comatous" for "comatose" and (on page 3) "acsophagostomum" for "oesophagostomum." One questions the usefulness of a clinical classification of subtertian malaria by symptoms rather than by underlying pathologic changes, and it is not allowable to refer to gametocytes as developing from schizonts.

The treatment of malaria should be revised and better organized. Many would not agree with the flat rules that any person from an endemic area should receive 10 grains daily of quinine for eight weeks, that sufficiently long use of quinine will eliminate "malarial infections" or that "when it is impossible to administer quinine by mouth, atabrine should be used."

There is no discussion of varying objectives of treatment under different conditions, as for instance various military and civilian requirements, or of varying requirements of different plasmodia or of utilization of malarial immunity in treatment. In spite of the aforementioned quotation, the statement is also made that all who "return by ship from tropical or highly endemic areas" should receive atabrine 0.1 Gm. thrice daily for five to seven days and then 0.1 Gm. daily for two months. Discussion is lacking of the basic pharmacology of the antimalarial drugs and of the relation of transfusion to malarial transfer. Mosquito control and malaria prophylaxis (suppression) are sketchy and quite inadequately presented. Reference is not made to species attack or to spraying, and final advice is given that "people who live in malarial districts should not leave their houses between sunset and sunrise."

A distorted clinical picture follows mention of gallstones as a complication of blackwater fever. Under trypanosomiasis, synonyms of "Bayer 205," e. g. "germanin," should be given. American trypanosomiasis by this time should certainly be divorced completely from thyroid disease and the chapter brought within range of present day knowledge.

The date of publication of the volume should have included the final demonstration of the sandfly vector of leishmaniasis by Swaminath, Shortt and Anderson in 1942. American leishmaniasis is not clearly presented, nor the geographic spread of oriental sore. Howard Fox, in valuable reviews of pinta and yaws, carefully but firmly pays his respects to Admiral Butler while maintaining the difference between yaws and syphilis.

The discussion of the rickettsioses by Pinkerton is clear and of sound clinical value. Soper on yellow fever has given an authoritative and useful survey. The clinical discussion of mycoses by Morris Moore is excellent, as are also the short chapters on snake bite by J. A. Oliver and Dudley Jackson. The material on noxious arthropods is scattered and not easily assembled for use, and in general the descriptions are not sufficient for rough identification.

This volume is therefore of variable and spotty value. The major part is excellent, well written by authorities. Other parts fall short of this level. For the purpose of a monographic clinical presentation of tropical medicine it needs additions, deletions and some rewriting, as already noted.

Chemical Analysis: A Series of Monographs on Analytical Chemistry and Its Applications. Editorial Board: Beverly L. Clarke, I. M. Kolb and Hobart H. Willard. Volume I: *The Analytical Chemistry of Industrial Poisons, Hazards and Solvents.* By Morris B. Jacobs, Ph.D., Senior Chemist, Department of Health, City of New York. Second revised reprint. Cloth. Price, \$7. Pp. 661, with 110 illustrations. Volume III: *Colorimetric Determination of Traces of Metals.* By E. R. Sandell, Ph.D., Assistant Professor of Analytical Chemistry, University of Minnesota, Minneapolis. Cloth. Price, \$7. Pp. 487, with 73 illustrations. New York: Interscience Publishers, Inc., 1941.

Physicians encountering industrial health problems and especially those who are concerned with the prevention of industrial disease will find volume I valuable. Designed primarily to summarize practical applications of analytical chemistry in industrial hygiene, it also serves as a reference work on the occurrence of hazard, physical properties, toxicity and physiologic response and methods of detection of a large number of substances currently employed in modern industrial production. The monograph is well organized. The analytical methods are clearly stated and well supported by adequate references to the original literature. The introductory portion of the text is devoted to the general consideration of industrial hygiene and industrial poisons, sampling, gasometry and methods for the handling and examination of dusts. Subsequent chapters give information on silica, various metals, compounds of sulfur, phosphorus and nitrogen, oxygen and ozone, halogen compounds, carbon monoxide, carbon dioxide, hydrocyanic acid and cyanogen. Almost half of the book is utilized to present the properties, actions and modes of estimation of some one hundred and twenty-five organic substances, including industrial solvents, raw materials of manufacture and chemical warfare agents. An appendix contains useful tables, among which are several concerned with the probable safe concentration limits of exposure for gases, vapors, metallic and other dusts and fumes.

Volume III was designed to present a number of useful modern methods for the determination of small amounts of

each of forty-five different elements, exclusive of the information provided on the rare earth elements. In the first part of the text a critical discussion of colorimetric trace analysis is given. General methods for the separation and isolation of small quantities of the elements by chemical and physical means are outlined and evaluated. There follows a logical treatment of colorimetric and spectrophotometric measurements, with discussion of their place in the estimation of trace elements. Nineteen colorimetric reagents which find practical application in trace analysis and the nature of their reaction types and specificity are described in the final chapter of this general part of the book. The remaining three fourths of the text is devoted to the discussion of the various elements encountered in practical trace analysis. Each element is considered in detail—separations, methods of determination and application of the methods given are presented. Although colorimetric methods for the determination of substances have been frowned on by some investigators as being peculiarly subject to error, such methods prove to be invaluable in the hands of investigators who take the trouble to consider the underlying principles involved. An understanding of the limitations of colorimetric and photometric technics, coupled with knowledge of the fact that annoying but surmountable interferences may occur in many chemical reactions, permits of a wide range of their application. This book on trace metal determination is well written; it contains many carefully chosen references to the original literature and to earlier compilations in the field of colorimetry. The author has made judicious use of structural formulas, tables and charts to clarify the subject and to illustrate the practical limitations of many of the procedures. Although the book is not directed specifically to the needs of the clinician, it should prove to be of great value to those investigating the influence of trace elements in biologic phenomena.

The Hogg Foundation Reports: A Summary of Three Years Work—A Forecast of Next Steps. Robert L. Sutherland, Director, Hogg Foundation for Mental Hygiene. Paper. Pp. 32, with 4 illustrations. Austin: Hogg Foundation for Mental Hygiene, University of Texas, 1944.

This pamphlet describes the work of the first three years of the Hogg Foundation and presents plans for the future. Established through a gift of Will Hogg to the University of Texas, the foundation is dedicated to an improvement of mental hygiene in Texas by bringing together knowledge of sound principles of human development from the specialized fields of psychiatry, physiology, psychology and sociology and applying them to the "conditions of growth and development of all persons." The work of the foundation is carried on at three levels. The first level consists of lectureships "to carry the basic principles of mental health to many fields of interest as well as to many localities." At the second level the foundation provides planned instruction in mental hygiene for professional leaders who are engaged in, or are preparing to enter, human relations work. This includes the professions of medicine, nursing, school guidance, industrial personnel, case work, group work and the ministry of the religious counselor. At the third level the foundation is assisting in the establishment of diagnostic clinics to detect the signs of maladjustment at an early stage and provide treatment. The foundation plans to continue and expand its work and will carry out studies and provide assistance in the adjustment problems of the returning veterans. The program of the foundation is educational, stressing prevention and early diagnosis and treatment. Such an approach to health problems deserves further development in other fields of health. It is especially important in the field of mental health, of which our wartime experiences have made us acutely conscious.

Guiding the Normal Child: A Guide for Parents, Teachers, Students, and Others. By Agatha H. Bowley, Ph.D. With a foreword by D. R. MacCallman, M.D. Cloth. Price, \$3. Pp. 174. New York: Philosophical Library, 1943.

This small work by an English psychologist is designed primarily for teachers but is also intended for parents. The dynamic psychology now current in our psychiatric thinking offers the theoretical background for the author; the Child Guidance Center and Nursery School provide the material for her observations of children and her practical and clinical

presentations. The book will appeal more to educators and to psychologists than to parents. It is authentic in content but not too well organized. An abundant but not too discriminating bibliography is offered. The typography is easily readable; the unappealing format is perhaps to be attributed to wartime restrictions in book making. A glaring error in the table of contents startles the reader.

The Art and Science of Nutrition: A Textbook on the Theory and Application of Nutrition. By Estelle E. Hawley, Ph.D., and Grace Carden, B.S. Second edition. Cloth. Price, \$3.75. Pp. 665, with 139 illustrations. St. Louis: C. V. Mosby Company, 1944.

In this edition the inclusion of the most recent advances in the science of nutrition constitutes the main addition. The present status of knowledge of vitamins and minerals is concisely and accurately recorded, with the recommended daily allowances of these elements listed. The material in the book is developed on the foundation of a thorough but direct and readily understandable presentation of the fundamental facts of normal nutrition. The abnormal states of vitamin deficiencies are gone into in some detail, with numerous excellent pictures demonstrating these conditions. The nutritional principles set forth in earlier chapters are later applied to the feeding of various population groups, from the family as a whole to its specialized members, such as infants, growing children and the aged. Consideration is given to the special physiologic requirements of pregnancy and obesity. Probably the strongest section of the book is that covering diet therapy. Here discussion is found of the dietary indications for every possible condition in which benefit may be expected from the use of a suitable diet. In addition to a statement of the principles involved, simple directions are given as to what foods to use and what to avoid. In many cases the discussion goes beyond the limits of nutrition by going into the etiology of the diseases and their symptomatology and differential diagnosis. The wisdom of this is questioned. The last section deals with the art of nutrition in the way of preparing foods for consumption. This part of the book consists of menus, lists of foods and reference tables of food values. Its didactic form leaves much to be desired for an artful presentation of the subject or the foods. It contributes little to the interest in the book, although it may be of value for reference. Altogether the entire work with its profusion of illustrations can be recommended as an excellent textbook for the instruction and practical use of nurses as well as practicing physicians.

A Textbook of Inorganic Pharmaceutical Chemistry. By Charles H. Rogers, Sc.D., Dean of the College of Pharmacy and Professor of Pharmaceutical Chemistry, University of Minnesota, Minneapolis. Third edition. Cloth. Price, \$7.50. Pp. 704, with 52 illustrations. Philadelphia: Lea & Febiger, 1943.

The earlier editions of this textbook, appearing in 1930 and 1936, served as commentaries on the inorganic compounds which were to be found as official drugs in the tenth and eleventh editions of the United States Pharmacopeia and in the fifth and sixth editions of the National Formulary. The present volume has been revised to include all the inorganic salts of organic acids, as well as the inorganic substances recognized by the U. S. P. XII and the N. F. VII. As in earlier editions, the elements are considered in an order which makes the volume suitable as a textbook on inorganic chemistry. The history and occurrence, physical and chemical properties, qualitative tests, method of preparation and, in addition, pharmacologic action and general uses of the substances are included. This edition is well printed, and excellent use is made of chemical equations in the presentation of chemical properties. It might be argued that some additional material could well be added to certain chapters; for example, the chapter on gold and gold compounds might include a discussion of the chemistry and pharmacologic action of sodium gold thiosulfate. Designed primarily for the student of modern pharmacy, the book, nevertheless, should serve as a useful source of information for physicians who are interested in gaining familiarity with the history and chemistry of many of the drugs which they may daily prescribe.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TOPICAL APPLICATIONS OF SULFONAMIDES AND PENICILLIN

To the Editor:—What are the therapeutic possibilities in injecting suspensions of sulfadiazine, sulfathiazole or other sulfonamides directly into or around the sites of localized infections? Mention of such treatment has not been found in available literature. It is understood that the soluble sodium sulfonamide preparations employed for intravenous therapy could not be used in this manner because they are intensely irritating and cause tissue necrosis. However, the less irritating and less soluble sulfonamides injected in suspension might be more valuable because of their low solubility, the gradual solution of the crystals in the tissues producing prolonged high concentration in the area of the infection. It is conceivable that administration of sulfonamides by this route might have value in many localized infections including furuncles, carbuncles, felon, cellulitis, gas gangrene, suppurative arthritis and infected cysts. Perhaps by this method effective concentrations of sulfonamides might be brought to bear on such infections, while their relative concentration in the blood and the rest of the body would be low, thus avoiding the unfavorable reactions of large doses of the drugs by mouth. Might it be indicated to attempt to develop preparations of sulfonamides especially for this use, the desirable characteristics sought being a minimum amount of irritation to the tissues and the property of dissolving into the tissues slowly? 1. Has there been any work along these lines of either experimental or clinical nature, and if so what were the results? 2. What are the drawbacks and contraindications? Specifically, would the injection of small amounts of crystalline sulfathiazole or sulfadiazine suspended in water or isotonic solution of sodium chloride produce local irritation or necrosis? 3. If the procedure is not contraindicated, what dosage and form of administration is suggested for typical cases? If this method of approach has not already been tried and found worthless, what are its possibilities? Does it justify a program of investigation? Could penicillin be administered in a similar manner?

M. D., California

ANSWER.—1. There apparently is no extensive series of published data relating to experimental or clinical investigations of this type. However, suspensions of sulfanilamide in isotonic solution of sodium chloride have been injected into infected pleural cavities. This procedure has been associated with some improvement. Likewise, such suspensions have been introduced into the peritoneal cavity where suppuration has been present. Although observations have not been too extensive, the results appeared to be favorable. Suspensions of sulfanilamide and sulfathiazole have been used in the nasal and aural cavities with apparent clinical improvement.

2. It is difficult to see how such a procedure would be of much benefit in the therapy of soft tissue infections such as carbuncles, cellulitis or infected cysts. The main object in therapy is to keep such infections localized, and it is now the consensus of many authorities that this can be best accomplished by oral or parenteral administration of adequate doses of sulfadiazine or sulfathiazole. The pendulum appears to be swinging away from the routine topical application of the sulfonamides in the therapy of localized, suppurative lesions. The main objection to the routine injection of sulfonamide suspensions is that it might not accomplish the anticipated therapeutic response. Such a procedure might well cause some local irritation, but no considerable degree of necrosis.

3. Since oral or parenteral sulfonamide therapy combined with adequate surgical drainage appears to produce desired therapeutic responses in comparison with the local use of the drugs, one cannot become too enthusiastic about the proposed investigation.

Now that penicillin is becoming available in larger quantities, more profitable lines of investigation are opening up. Solutions of penicillin have been introduced into the pleural cavities in instances of suppurative infections with remarkable clinical improvement. It is unlikely that the injection of penicillin solution into soft tissue infections will offer any advantage over systemic treatment.

VITAMIN A FOR ACNE VULGARIS

To the Editor:—A dermatologist has prescribed 100,000 units of vitamin A to be taken daily for six months for the treatment of acne vulgaris. Is it dangerous for an 18 year old girl to take such large amounts of vitamin A for six months? What is the efficacy of such treatment?

M. D., Tennessee

ANSWER.—A hundred thousand units of vitamin A daily seems a moderate dosage. Lehman and Rapaport (THE JOURNAL, Feb. 3, 1940, p. 386) mention a single dose of 2,000,000 units given as a test for visual deficiency, and the authors themselves gave from 100,000 to 300,000 units daily for months to children with no bad effect. Harm from overdosage does not

seem likely. Long continued treatment is necessary in most cases to obtain benefit from vitamin A. Its value in acne vulgaris has not yet been proved to the satisfaction of dermatologists generally. An excellent paper on the subject is that of Straumfjord (Northwest Med. 42:219 [Aug.] 1943). He reports that 36 patients were entirely freed from lesions and 43 others were cleared except for an occasional papule or pustule. Of 28 of those wholly freed, 64 per cent were cleared in nine months or less and 89 per cent in twelve months or less. Some remained well without further dosage of the vitamin; others relapsed and had to resume the vitamin consumption. There were more of the latter group among those who had cleared comparatively early. Thus it is seen that the treatment is slow but harmless, and it is successful in a good percentage of cases—even some that had failed to improve on other methods of treatment. Scarring acne should receive other more rapid methods of treatment which can well be combined with the vitamin method.

TREATMENT OF WHOOPING COUGH

To the Editor:—What, if any, value has Sauer's vaccine following exposure to pertussis or during a current epidemic? A pertussis vaccine is available through the state laboratory service and is widely used by the local pediatricians in the treatment of pertussis. To date I have advised the parents of the children whom I have seen as follows: Isolate their children from exposure to the disease if possible. If they should develop symptoms, have the therapeutic series of treatments with the state provided vaccine; if not, wait until the epidemic subsides and then have the prophylactic series, using Sauer's preparation. I have based this advice on the assumption that it would take three to four months to develop immunity using Sauer's vaccine. In the meantime, if the children should develop symptoms, would they be sensitized to the extent that use of the therapeutic vaccine would be ill advised?

M. D., New York.

ANSWER.—It is doubtful whether any pertussis vaccine is of value as a therapeutic agent; i. e., in the treatment of the disease. The Sauer vaccine, made with human blood, can be used repeatedly, if necessary, without any risk. Its chief use is as a preventive agent, especially in infants past 7 months of age.

In treatment of infants and frail young children ill with the disease, either after definite exposure or at the onset of definite symptoms, two doses of the human hyperimmune (lyophilized) pertussis serum may be beneficial. It is prepared by the Serum Exchange at the University of Philadelphia and is by far the most desirable therapeutic product available. The subject is discussed by Brennemann in his Practice of Pediatrics, volume 2, chapter 34.

"ENLARGED PORES" OF SKIN

To the Editor:—A woman aged 19 had been working in a defense plant. She had been exposed to excessive heat over a period of six months. She stopped working because the pores of her face (on the forehead and the tip of the nose) had become excessively enlarged and remained that way. Many preparations have been used in the last five months but to no effect on these enlarged pores of the skin, especially of the nose.

J. T. Nardo, M. D., Somerville, Tenn.

ANSWER.—The texture of the skin can be changed by age, disease or alterations of the secretions of the endocrine glands. Sweating is a normal function of the skin, and no evidence has been found that excessive sweating can cause enlargement of the hair follicles. Efforts to lessen the size of the pores by external applications are not likely to succeed. Patting the skin or the application of heat, according to H. G. Goodman (Cosmetic Dermatology, New York and London, McGraw Hill Book Company, 1936, p. 217) causes a temporary swelling of the skin and lessening of the size of the follicular openings. Astringents have the same effect in a greater degree by causing a slight inflammation. Even so vigorous a measure as skin peeling is likely to result in only temporary effect. Unless the large pores are actually comedones, the use of roentgen rays to lessen the activity of the sebaceous glands seems hardly justifiable.

INJECTIONS FOR SPRAINS

To the Editor:—I wish to comment on the discussion of "Local Anesthesia Injections for Sprains" in Queries and Minor Notes in The Journal, July 15, 1944. The purpose of injecting painful areas in sprains with a local anesthetic is not only to give immediate relief from pain but, what is more important, to relieve spasm of the surrounding tissues, which always occurs following injury. The mere injection of the ligaments around a joint cannot repair the damaged tissues. Following the injection, the area should be massaged in order to avoid accumulation in any one area and pressure necrosis from procaine. Recovery is expedited by good support of the joint with proper strapping, which will support the joint and enable the patient to walk freely. This in turn will encourage lymph flow and return. For example, in the ankle joint, flexion and extension or the forward and backward movements of the foot are permissible, however, the rocking of the foot or ankle from side to side will stretch the affected lateral ligaments, which aggravates the injury. The method should not be condemned unless it is properly executed. The injection treatment is an adjunct and not a substitute for the practice of good surgery in the management of sprains.

T. A. Ranieri, Lieut. (jg), (MC), U. S. N.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 4

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

SEPTEMBER 23, 1944

RELOCATION OF PHYSICIANS

A PREREQUISITE TO BETTER MEDICAL CARE

CHAIRMAN'S ADDRESS

JOSEPH W. MOUNTIN, M.D.

Medical Director, U. S. Public Health Service

WASHINGTON, D. C.

Most of the current controversy in respect to medical care centers on methods of paying for service rather than on how the service is to be provided. These are separate but intimately related questions. The former is likely to be determined finally as a political issue, while the latter should be solved by the medical profession itself. Since the physician is the central figure in any scheme of medical service, primary consideration must be given to placing physicians in areas where they are most needed. Although persons residing in certain localities and belonging to underprivileged classes of the population have illness rates somewhat higher than those of people living under better circumstances, a straight population enumeration gives a fairly accurate measure of the relative needs for medical service in one area as contrasted with another. Unfortunately, wealth more than population normally determines the number of physicians to be found in the average community.

As compared with recent years, the distribution of physicians appears to have been more equable at the beginning of this century. According to tradition and such data as are readily available, it would seem that physicians then were to be found in every hamlet and even at some of the crossroads. Since that time there has been a progressive decline in the numbers of rural physicians and an increasing tendency for more of the recent graduates to locate in the larger urban communities. Moreover, a simple numerical count does not tell the whole story. Rural physicians are much older, and hence their expectancy in years of professional service is less than for those in centers of population.

For purposes of this discussion, the year 1940 is taken to represent normal peacetime conditions. War abroad had stimulated the domestic economy to a point where recovery from the depression was nearly complete. Furthermore, the two basic documents on which this paper is based, the 1940 United States Census Reports¹ and the directory of physicians,² were current for that year. Data for these publications were gathered before the normal way of life had been materially disturbed by the national Selective Service and training program.

From the States Relations Division, Bureau of States Services, U. S. Public Health Service.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Sixteenth Census of the United States, 1940 Population: First series, number of inhabitants, United States summary, United States Department of Commerce, Bureau of the Census, 1941.

2. American Medical Directory, ed. 16, Chicago, American Medical Association Press, 1940.

In 1940 there were 175,000 physicians listed in the directory or 1 for each 751 persons in the continental United States. Among the several states the number of physicians varied from 1 for every 492 persons in New York State to 1 for every 1,459 in Mississippi. However, about 10,000 of the total group were designated as retired and 4,800 as in federal service. This reduced the physicians available for local service to approximately 160,000. Of this number nearly 15,000 occupied full time positions in institutions, 6,000 were teaching or combining hospital and teaching work, and approximately 2,600 were employed full time in state and local health departments. With few exceptions the others, numbering about 136,000, were engaged in private practice.

From the standpoint of capacity to serve, the count of 160,000 physicians available for local service is somewhat misleading. This enumeration includes medical personnel of all age groups; however, Ciocco and Altman³ have found that the service performed by a physician in private practice varies decidedly with age. The activity of an average private practitioner reaches a peak of approximately 170 patients per week in the age interval between 35 and 40 and continues almost on a plateau for a comparatively few years. After that the physician faces with advancing years a continuous decline in patient load which, without doubt, is closely correlated with capacity to serve. Moreover, the practice of a young physician just beginning his career undergoes a building up period of several years during which he sees fewer patients than he could handle, simply because he has not yet won the confidence of the community.

Curve A in the chart illustrates the service cycle experienced by an average active physician and emphasizes the necessity for establishing criteria other than simple numerical counts of physicians for estimating the professional resources of a community. From this curve appropriate measures of a physician's capacity for service at each year of life may be estimated. Such index values represent approximate service equivalents⁴ of physicians at different ages. On this basis an average physician of 26 renders service equal to approximately one fourth of that which he will render in his fortieth year. The fraction increases to three fourths when he is 31 and reaches 100 per cent before he is 40. The decline of activity with advancing age is somewhat more gradual. The fraction falls to three fourths when he is 53, one half at 64 and one fourth at 75 years. Naturally this does not imply that all physicians operate

3. Ciocco, A., and Altman, I.: The Patient Load of Physicians in Private Practice: A Comparative Statistical Study of Three Areas, Pub. Health Rep. 58: 1329-1351 (Sept. 3) 1943. Also unpublished data from Ciocco's and Altman's study showing numbers of patients seen per week by physicians in five year age intervals.

4. Pennell, E. H.: Location and Movement of Physicians—Methods for Estimating Physician Resources, Pub. Health Rep. 59: 281-305 (March 3) 1944. Pennell defines service equivalent as "the decimal fraction obtained by dividing the average weekly number of patients seen by a physician of designated age by the corresponding number seen by a physician at the peak of his career."

at the service capacity indicated. These constants are presented as approximations for the average active practitioner. When for a given community the total number of physicians at each age is multiplied by the fraction that expresses their combined service capacity and the results are added, there is provided a comparative estimate of existing local physician resources which is more revealing than a numerical count.

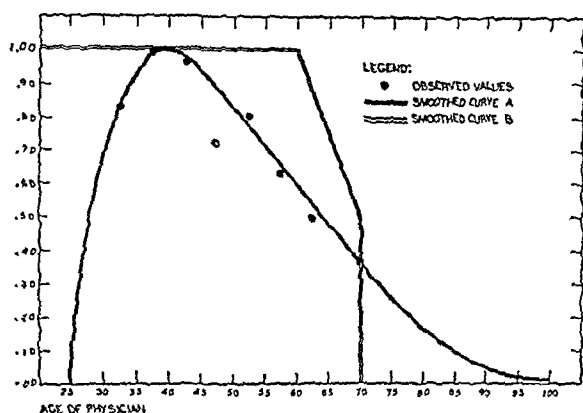
For certain portions of the country and among particular population groups the deficit between physicians in practice—whether considered in terms of a simple enumeration or a calculated capacity to serve—and the number needed for adequate coverage is even more pronounced than when figures are completed on the basis of broad areas. For example, when physician totals are analyzed from the standpoint of community characteristics, one is impressed by the tendency of physicians to locate in areas that present attractions in the form of wealth, physical facilities essential to good medical practice and the presence of other physicians, particularly those representing the specialties. Since wealth seems to be the dominant factor, it will be analyzed first. To simplify the presentation, actual

in a particular area is the presence of general hospitals. Comparative data for physicians and hospitals reveal that large numbers of hospital beds reflect increased physician-population ratios. In those six states providing less than 2 beds per thousand of population⁶ there were 1,141 persons for each physician, whereas in the ten states affording 4.5 beds or more there were only 522 persons for each practitioner. While the same basic factor—wealth—influences the location of both physicians and hospitals, data assembled by the United States Public Health Service, but not presented on this occasion, show that the presence of a hospital alone serves to attract and retain physicians.

Factors affecting the physician distribution not only weight the total but to an even greater extent influence the location and migration pattern of the younger men. In 1938, for example, of a group of young practitioners graduated in 1935, 57 per cent remained in large cities and 18 per cent were found in rural areas. In contrast, study of a group of 92,000 physicians long in practice shows that 49 per cent of these established physicians were in large cities and 23 per cent in rural areas at this date. Even when the latter distribution is used as a base—itsself depicting a smaller proportion of physicians than of the general population in rural areas—it is evident that new recruits are particularly inclined to begin initial practice in large cities. Moreover, rural communities not only fail to attract a proportionate supply of recent registrants but also they hold relatively fewer physicians who have developed practices than do urban localities. Analysis of the migration pattern for established practitioners whose period of professional activity extended over a subsequent fifteen year interval reveals that rural areas suffered a net loss of 10 per cent through transfers to more urban communities. On the other hand, physician migration brought about an actual gain of 10 per cent in small cities, whereas in large cities the effect of such changes on physician totals was practically negligible.

The low rate of recruitment combined with the loss through migration has resulted in an age distribution for physicians in rural areas which is heavily weighted in the advanced age categories. As a matter of fact, physicians in rural counties have a median age of 57 in contrast to a median age of 44 for those in large city counties—a difference of 13 years. Since physicians of the rural group are older, the fact that proportionately more physicians are lost from the profession by death in this than in any other location category is not surprising.

This was the picture in 1940. What are the prospects for the future? To begin with, about one third of the active physicians have been withdrawn from civilian practice. Furthermore, despite all efforts to retain physicians where most needed, the number per unit of population is diminishing at an increased rate in states normally deficient in professional resources. Moreover, as a result of the small number of new recruits who have entered practice in the poorer states during recent years, these states have a distribution weighted with older physicians who, because of their age, are subject to a high death rate. For example, in New York State 9 per cent of the physicians were 65 years of age or over in 1940, while in Arkansas and Maine 25 per cent of all practitioners were in that category. Since



Smoothed curves portraying A, relative number of patients seen in a week in 1942 by active physicians of different ages engaged in private practice (number seen at age 40 equals 1.00); B, full utilization of physicians to age 60, declining activity from 60 to 70 and retirement at 70.

physician totals tabulated from the 1940 directory are used henceforth in this paper rather than full service equivalents.

Counties with average annual per capita incomes of less than \$100 attract only 45 physicians per hundred thousand of population. In those with per capita incomes of \$600 or more, the number of physicians for a corresponding unit is nearly four times as great. Among the younger practitioners these differences are sharply accentuated. Of those in practice under 45 there are only 12 per hundred thousand in the counties with the least per capita income, whereas the proportion increases to 92 in the counties of greatest wealth.

Likewise there is a high degree of association between urban character of a county and the number of physicians located therein. Rural, small city and large city counties,⁵ for each hundred thousand of population, average 67, 101 and 179 physicians respectively. That strictly rural counties are at a great disadvantage from the standpoint of availability of medical personnel is strikingly portrayed by these data.

Another factor—itsself an indirect reflection of wealth—which influences the tendency of physicians to settle

5. Rural, small city and large city counties are defined as counties that do not contain any incorporated place of 2,500 or more inhabitants; counties containing cities of between 2,500 and 49,999 inhabitants; and counties containing cities of 50,000 or more persons respectively.

6. The 1942 Census of Hospitals, report of the Council on Medical Education and Hospitals, J. A. M. A. 121: 1692-1694 (March 27) 1942. Exclusive of all mental and tuberculosis hospitals, infirmary units of institutions and all other hospitals of federal control except hospitals operated by the Bureau of Indian Affairs.

the general scarcity of physicians renders city locations more attractive, the small number of current graduates who will be channeled into civilian practice will be even less inclined than formerly to engage in rural practice. Thus, states with lowest ratios of physicians and the greatest percentage of loss through death and retirement can expect few accretions to the profession.

The figure suggested as the minimum for wartime safety has already been reached or passed in many areas. Perrott and Davis⁷ have shown that in 1942 there was approximately 1 active private practitioner per thousand persons for the country as a whole. They estimate that early this year this rate will reach 1:1,500. During this year twenty-eight states are expected to have more than 1,500 persons per active private physician. This presents a striking contrast to the six states in a similar position before recruitment for military duty began.

Statistics based on 1940 data show that there was need at that time for relocation of at least 25,000 physicians to bring about a fair measure of equalization in the distribution. Since 1940 the situation obviously has grown worse, owing to the disproportionate loss of physicians from areas formerly deficient. Up to this time there have been practically no replacements.

Because of the present overall dearth of physicians and the widespread augmentation in purchasing power of the American people, urban physicians in civilian practice tend to remain where they are. The relatively few who are now being mustered out of service are, for the most part, older physicians with one form of disability or another. Those with city ties probably will tend to return to their places of residence, while many formerly in rural areas will take advantage of the facility with which city practices can be developed. At present, however, the returning veteran physicians are not sufficiently numerous to make any real impression on the problem.

The great opportunity for mass relocation of physicians will occur after hostilities cease. Already the armed forces contain a large number of physicians who have entered military service directly from hospitals in which they received their intern or residence training. As the war continues, the medical corps will consist more and more of physicians who have never undertaken civilian practice. Moreover, those physicians who engaged in private practice prior to the war soon will have been away for such a period of time that resuming practice will be essentially the same as starting anew.

If, after the war, full advantage is to be taken of the unusual opportunities for equalizing the distribution of physicians, many of the basic difficulties associated with medical practice in underprivileged areas must be overcome. In brief, these difficulties are (1) low income, (2) lack of hospitals and (3) professional isolation. The remedial measures are obvious, though they may not be simple to apply. Matters are further complicated by questions involving both social policy and political expediency.

Combining money assets through a broad program of taxation or insurance would assist materially in solving the economic problem in areas of low per capita income. Another approach would be some degree of subvention for physicians willing to practice in communities where otherwise they could not be assured of a satisfactory financial return. A further requisite for the attraction and stabilization of physicians in rural areas is an

arrangement whereby they will have access to appropriate diagnostic and treatment facilities. The growing interest in rural hospitals must not be taken to imply that every rural physician can or should have a fully equipped hospital immediately at his command. Outposts with diagnostic and first aid equipment must suffice for the more remote areas.

Professional isolation suffered by the physicians in rural communities acts as a deterrent to the establishment of medical practice. Recent medical graduates especially are reluctant to locate in places where, because of restricted professional association, their opportunities for further technical development are limited. With the expansion of hospitals and related facilities, however, it will be easier than heretofore to arrange continuing programs of education for physicians serving in rural areas. An additional measure for promoting professional growth is the provision of periodic refresher courses. To this end pilot projects undertaken by certain of the universities and medical societies should be extended, systematized and given a stable basis of financial support.

Another way in which a substantial impression might be made on rural medical practice is that of bringing about more effective utilization of physicians who do elect to practice in those areas. Solution of this question, while applicable to all physicians, is more urgent for those in the less populous regions. Excessive wastage of time and strain imposed by travel, together with responsibility for both day and night calls, taxes to the utmost the physical capacity of the practitioner serving rural communities. In the chart indicating the proportion of patients seen at each age level, curve B is constructed to show the extent to which the effectiveness of physicians at both ends of the age scale might be augmented. Studies⁸ show that if maximum use could be made of the professional capacity of physicians at all ages up to 70 years the total volume of physician service available to the general population might be increased by about one fourth. Such a purpose is not likely to be attained unless physicians work as groups, preferably in connection with hospitals or health centers. In this manner both the potential capacity of the younger man can be utilized and the energy of the more experienced physician conserved. Experienced practitioners could then devote much of their time to consultation. By this procedure the younger physician receives seasoned judgment, the older man is relieved of much time and energy consuming detail, and, what is more essential, the patient benefits by the team work.

SUMMARY

Low income, lack of essential facilities and professional isolation contribute to the maldistribution of physicians. If, after the war, full advantage is to be taken of the unusual opportunities for equalizing the distribution, many basic difficulties associated with medical practice in underprivileged areas must be overcome. Combining money assets through a broad program of taxation or insurance would assist materially in solving the economic problem in areas of low per capita income. Arrangements should also be worked out whereby physicians in rural locations will have access to appropriate facilities—either hospitals or health centers. In addition, provision for periodic refresher courses should be an integral part of any scheme for improving and extending medical practice.

7. Perrott, G. St. J., and Davis, B. M. *The War and the Distribution of Physicians*, Pub. Health Rpt. 53:15-5154 (Oct. 15) 1943.

8. States Relations Division, Bureau of States Services, United States Public Health Service, unpublished data.

PRIMARY CARCINOMA OF THE TRACHEA

TREATMENT WITH INTRATRACHEAL RADIUM; RADIOACTIVE IODINE FAILS TO SHOW THYROID ORIGIN

PHILIP H. PIERSON, M.D.

SAN FRANCISCO

Carcinoma of the trachea was apparently first recognized by Türck¹ in 1866, at which time he described 2 cases in which the disease was secondary to carcinoma in the esophagus and 1 case in which it was secondary to carcinoma of the thyroid. The first case of primary carcinoma of the trachea was reported by Langhans² in 1871. His patient, a man of 40, had suffered from dyspnea for a year and finally died of suffocation. It was found that "his primary disease had originated in the submucous glands and eventually involved not only the trachea but some spread had occurred into the right stem bronchus."

A review of the literature will be made later.

The patient who is the subject of this report is well after two years and presents several problems that are interesting and instructive:

REPORT OF CASE

R. H., a man aged 61, married, a lecturer, whose past history was irrelevant, had a great deal of cough and was very tired during the last six months of 1938. There was no shortness of breath, wheezing or loss of weight. He was quite comfortable during the first six months of 1939, but during the summer his cough returned and he expectorated some blood on several occasions during August and September. By November he was again feeling very tired (possibly because of a very heavy schedule). Every two or three months after November 1939 he had bouts of cough and sputum, which was frequently bloody, but there was no fever. During the later part of 1940, while at an altitude of 4,500 feet for two months, he noticed more shortness of breath than for a long time. Because of the protracted "colds," cough and hemoptyses, he came to Palo Alto, Calif., in December 1940. The cough was somewhat better, but periodically there were bouts of hard coughing, expectoration of some yellow material and somewhat larger quantities of blood. It was not until March of 1941 that he developed wheezing, which not only interfered with his lecturing but reduced his voice to a whisper. This was associated with periods of intense suffocation. He had never seen a doctor about it before 1941. In May, after nearly three years of symptoms, he consulted Dr. Russell Lee, who referred him to me. His weight had fallen to 147 pounds (67 Kg.) from a customary 160 to 165 (73 to 75 Kg.). His father and brother had died of cancer of the lung, and several of the family had had tuberculosis.

Physical examination was negative except for enlarged tonsils and a slightly prolonged expiration at the base of both lungs. X-ray examination of his lungs showed some increased linear markings at both bases but a normal mediastinum. On May 24 bronchoscopy revealed a tumor (fig. 1) just above the carina, occupying at least one half of the lumen of the trachea. It extended over the whole cartilaginous portion of the lower trachea for a distance of 2.5 cm. but apparently spared the posterior portion. Its base was broad and firmer than the pale, lobulated and softer superficial tissue. Biopsies were taken then and at subsequent operations and have been summarized

by Dr. David Wood as follows: "The tumor is a low grade, well differentiated primary carcinoma of the trachea. This tumor could well have had its origin from submucosal tracheal glands. Its acinar structure and intra-acinar homogeneous secretion, however, cause the tumor to bear a striking resemblance to neoplastic thyroid tissue. Histogenically its possible origin from aberrant thyroid tissue cannot be definitely excluded. Inability of the tumor to store radioactive iodine does not exclude its possible origin from aberrant thyroid tissue. The possibility of the tumor being metastatic from thyroid tissue elsewhere is extremely remote. Therefore the case at the present time is considered to be one of primary adenocarcinoma of the trachea."

After the second bronchoscopy the patient felt a great relief in his breathing and after five sessions of removing as much tumor as possible its appearance on October 23 was that of a very superficial layer of tumor tissue.

The question arose as to whether this tumor developed from a misplaced anlage of thyroid tissue, although roentgenograms showed no substernal mass suggesting a thyroid gland and

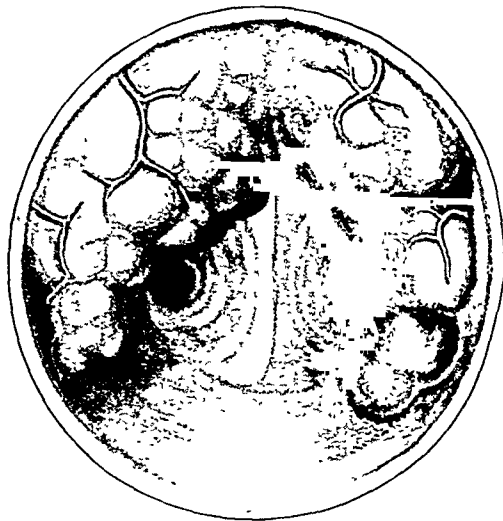


Fig. 1.—Bronchoscopic appearance of tumor.

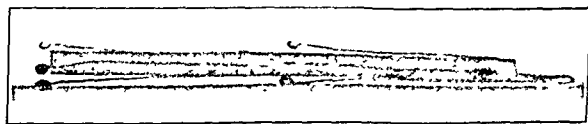


Fig. 2.—Radium applicator completely folded in the bronchoscope.

laminograms also quite accurately delineated its size and position. We hoped to determine this by use of radioactive iodine, which Dr. Joseph Hamilton of the Radiation Laboratory at the University of California provided. The patient drank a small portion of the material on September 22 and when tested with the Geiger counter September 24 showed intense activity (several hundred counts per minute) in the lower part of the neck. Development of a "cold" prevented bronchoscopy, however.

On October 21 the counter, set close before the neck, gave only 50 counts per minute ($4\frac{1}{2}$ times the background). He then drank another dose (200 microcuries) of radioactive iodine, with immediate increase in the general body radioactivity (counts close to the hand, 30 per minute). On this occasion the concentration in the neck was not followed. Two days later, October 23, I removed several pieces of tumor by means of the bronchoscope. Dr. Hamilton examined these but could find no radioactivity in them. This ruled out the presence of normal thyroid tissue but did not necessarily exclude carcinoma of the thyroid, for malignant thyroid carcinoma is known not to collect radioactive iodine as normal or hyperplastic thyroid does.

At this bronchoscopy I had planned to treat him with radium in a special applicator which Dr. Robert Newell had prepared, but this was broken during the attempt to place it. Dr. Newell

From the Department of Medicine, Stanford University School of Medicine.

Dr. Robert E. Newell of the Department of Roentgenology devised the radium carrier and supervised its application. He also gave help and encouragement throughout. Dr. David A. Wood of the Department of Pathology gave untiring cooperation. My son, Dr. Robert E. Pierson, made the drawing.

1. Türck, L.: Klinik der Krankheiten des Kehlkopfes und der Luftröhre, Vienna, W. Braumüller, 1866.

2. Langhans: Primärer Krebs der Trachea und Bronchien, Virchows Arch. f. path. Anat. 33: 470, 1871.

rebuilt the radium carrier, and on November 6 I placed it in the trachea in the region of the residual tumor. X-ray films were made with the tip of the forceps held at the distal margin of the tumor and the bronchoscope held at the proximal border; then the placement of the radium was checked with films according to these. The patient coughed the radium out after three and one-half hours.

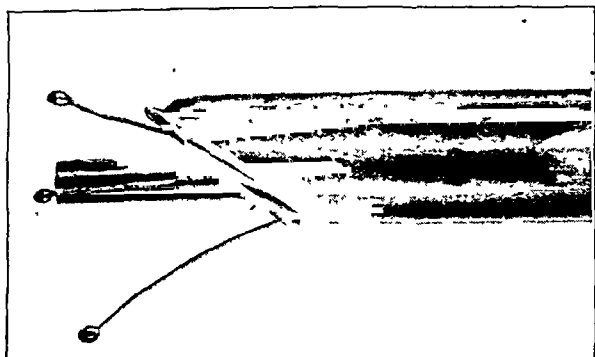


Fig. 3.—Radium applicator partly protruding from the bronchoscope.

On November 27 radium was placed similarly, but the applicator was broken against the bronchoscope in trying to readjust its placement; it was retained for about one-half hour. On December 19, by means of a new applicator, radium was placed again, everything going smoothly because the patient was well sedated, and was successfully retained for five hours, as planned.

The radium was in four tubes, each containing 25 mg., set with 12, 16 and 12 mm. spacings down the axis of the trachea. Allowing for crossfire, the calculated total dosage November 6 to December 19 amounted to about 5,000 roentgens at a radial distance of 8 mm. and about one-half that at a radial distance of 12 mm.

Since treatment the patient's tracheal condition has been studied in April 1942 and in January and November 1943, and at all of these times there has been no evidence of any abnormality except possibly a little thinning of the mucous membrane in the area occupied by the tumor. On physical and x-ray examination there was no evidence of any increase in the mediastinal glands. The patient's general health is excellent; he walks considerable distances and lectures without any shortness of breath or cough. He shortly regained his normal weight and has maintained it.

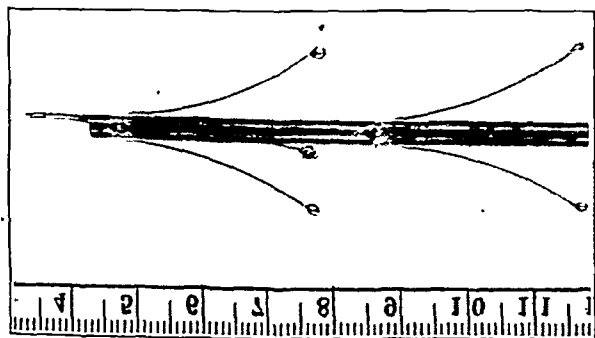


Fig. 4.—To show size of applicator.

SUMMARY

A man of 61 who had intermittent bouts of severe cough, dyspnea, suffocation and moderate hemoptyses for three years was found to have a primary adenocarcinoma of the trachea. An attempt to prove the histogenic origin from aberrant thyroid by the use of radioactive iodine was unsuccessful. After removal of as much as possible of the tumor through the bronchoscope, the remnant was treated by radium applied within the trachea. Two years after treatment there are no subjective or objective evidences of tumor.

COMMENT

In 1890, reported in 1898, von Bruns³ operated on a patient aged 31 in whom dyspnea had been present for ten years. The tumor he found apparently had arisen from thyroid tissue. It was his feeling "that thyroid tissue might be present in the trachea (1) from aberrant thyroid tissue in the germ or (2) that it could penetrate from outside into the trachea between the tracheal rings during extrauterine life. This can happen only if there is a growing together of the thyroid gland and trachea, established by an embryological disorder of development of the thyroid capsule which is missing there, allowing the glandular tissue to proceed directly into the perichondrium." His operation removed the trachea over a distance of ten rings and also the anterior surface of the esophagus. A tracheal tube was put in place and the patient was comfortable until stenosis again occurred and he died, six years after the first operation. This is apparently the first operation for the complete removal of a primary carcinoma



Fig. 5.—Radium applicator in trachea, bronchoscope being withdrawn.

of the trachea. He also felt that in two thirds of the reported cases the tumor was in the upper and middle thirds of the trachea and that very rarely did a carcinoma there metastasize or invade the surrounding tissues.

In 1908 Nager⁴ reported that in observations made at the Pathological Institute at Basel, Switzerland, between 1871 and 1905 in 1,078 cases of carcinoma the thirteenth in frequency were 19 cases of carcinoma of the lungs and bronchi and twenty-second were 9 cases of carcinoma of the larynx, and no cases involving the trachea were found. He reported a case in which a squamous cell carcinoma measuring 3 by 3.5 by 2 cm. was present just above the right main bronchus, and he states that this location near the bifurcation is favored for tumors and diverticula because this is the region where the separation of the "anlage" of the lungs and the foregut starts.

3. von Bruns, P.: Resection der Trachea bei primärem Trachealkrebs, Beitr. z. klin. Chir. 21: 284, 1898.

4. Nager, F. R.: Ueber das primäre Tracheal Carcinoma, Arch. f. Laryng. 20: 275, 1908.

In 1909 Schmigelow,⁵ reviewing the literature, found that von Bruns had collected 28 cases of primary carcinoma of the trachea, and he added 12 more from the literature and a case of his own, in which he had done a tracheal resection, the patient being well six years after the operation.

In 1911 Simmel⁶ reported the occurrence of difficulty in swallowing, cough, fetid expectoration, hoarseness (paresis of both vocal cords), hemoptysis and cachexia in a man aged 77. Esophageal "probing" located a resistance 25 cm. from the teeth, and this was thought to be due to a carcinoma of the esophagus perforating into the trachea. At postmortem a primary carcinoma of the trachea was found, with the esophageal lining intact, the tumor extending from just below the cricoid cartilage to a few centimeters above the bifurcation, producing a diverticulum of the trachea.

By 1913 von Bruns⁷ brought the number of reported cases of primary carcinoma of the trachea up to 81 and an additional 174 cases of benign tumors of the trachea, making the ratio of malignant to benign tumors of the trachea about 1:2. To this figure of 81 Heymann⁸ added 33 cases from the literature and 1 of his own. After two attempts to remove the tumor completely by tracheoscopy had failed, transverse resection of the trachea was performed by Gluck and the patient was well two years later.

In 1915 Soerensen⁹ reported another case of "aberrant retrotracheal goiter showing cancerous degeneration and growth into the trachea from behind." The patient was well two years after transverse resection of the trachea. He strongly recommended resection of the trachea because (1) other methods of operation were insufficient, (2) it was relatively not dangerous, even in total removals, and (3) the functional effects were good if the recurrent nerve could be preserved. He felt that it was contraindicated if the bifurcation itself was involved by the tumor or if the vessels in the neck were grown together. Growing together of the esophagus and trachea would not exclude, *ipso facto*, the possibility of operation.

According to Chiari,¹⁰ primary carcinomas are the most frequent tumors of the trachea and occur more often in men between the ages of 50 and 60. They generally form broadly sessile tumors with globular or knobby surfaces, sometimes extending over several rings, but seldom are they pedunculated, and rarely do they infiltrate deeply below the surface, at least not until a considerable time has elapsed. They may eventually extend into the mediastinum, esophagus or thyroid gland. Secondary carcinoma may develop from cancer in the larynx, or it may be from the esophagus, bronchus or thyroid. Very rarely is it metastatic in the trachea from any distant focus. He too feels that radical intratracheal extirpation is rarely successful and that the operation of choice is radical transverse resection of the trachea.

Feichtinger¹¹ proceeded with his operation in two stages: first a tracheotomy for full exploration of the extent of the tumor and later transverse resection.

Otto Maier¹² removed a papillary cystadenoma in his case by a deep tracheotomy and then extirpation of the tumor by "bisecting the trachea downward," suturing its walls together after the removal of the tumor.

The largest group observed by one person up to 1921 was by Fraenkel,¹³ who carefully studied 8 cases. His conclusions were, briefly, that it is a rare condition, found more often in men than in women and between the ages of 50 and 70. Its location is generally at or near the bifurcation, having a preference for the anterior and not for the posterior wall, as previously stated, and its shape is that of a flat infiltration rather than of a globular tumor. The general symptoms, although not pathognomonic, are hoarseness or a debility of the voice, cough with uncharacteristic sputum, dyspnea of varying degrees, stridor and often trouble with swallowing. He places some importance on the early beginning cachexia, the swelling of the glands in the neck and bouts of suffocation. The diagnosis is made by roentgenograms and tracheoscopy with biopsy. The course of the disease varies from three months to two years. In his experience death results from the extension of the disease into the surrounding tissues. He feels that the origin of the tumors is chiefly from the epithelium of the mucous glands and only rarely from the pavement epithelium.

Stenström¹⁴ apparently agrees with Fraenkel in regard to the extension of the tumor to the mediastinum, for in 13 of 19 cases it had infiltrated the mediastinum, and only 6 were completely confined to the trachea.

Between 1925 and 1933 a few cases were reported by Borries,¹⁵ Soerensen,¹⁶ Hart and Mayer,¹⁷ Holmgren,¹⁸ Minnigerode,¹⁹ Wolfgang Tiling²⁰ and Teubner.²¹ The extreme rarity of the disease is statistically presented by Holmgren and Wolfgang Tiling.

In 1926 Adam²² reported 4 cases of tracheal tumor, 2 epitheliomas, 1 soft fibroma and 1 endothelioma. He treated the first 2 with radium, but death occurred within six months.

The patient observed by Bowing and Vinson²³ had been ill three and one-half years with frequent colds, hemoptyses, slight fever, cough, considerable dyspnea on slight exertion and frequent asthmatic seizures. He had been sent to New Mexico for tuberculosis. They found a tracheal carcinoma, removed it by surgical diathermy and gave radium over the sternum.

A few other cases have been reported in the American literature, but their repetition adds little more to what has been already described.

12. Maier, O.: Die Lehre von den intratrachealen Tumoren in Anschluss an einen Fall von Cystadenom, Beitr. z. klin. Chir. 120: 430, 1920.

13. Fraenkel, E.: Ueber Luftröhrenkrebs, Deutsches Arch. f. klin. Med. 125: 184, 1921.

14. Stenström, B.: Carcinome parti de la trachee et s'accompagnant de parésie du nerf recurrent droit, Scandimav. 71: 82, 1929.

15. Borries, G. V. T.: Primärer Trachealkrebs, Zentralbl. f. Hals-, Nasen u. Ohrenh. 8: 688, 1925-1926.

16. Soerensen, F.: Die Chirurgie des Kehlkopfes und der Luftröhre Chirurgie 4: 158, 1927.

17. Hart and Mayer: Kehlkopf, Luftröhre und Bronchien, in Henke, F., and Lubarsch, O.: Handbuch der speziellen pathologische Anatomie und Histologie, Berlin, Julius Springer, 1926, vol. 3, pt. 1.

18. Holmgren, G.: Zur Kasuistik der primären Trachealkarzinome, Arch. f. Ohren-, Nasen u. Kehlkopf. 122: 145, 1929.

19. Minnigerode, W.: Die Geschwülste der Luftröhre und der Bronchien, in Denker, A., and Kahler, O.: Handbuch der Hals-Nasen-Ohrenheilkunde, Berlin, Julius Springer, 1929, vol. 5.

20. Tiling, W.: Ueber Trachealkarzinome im Anschluss an einen Fall von Basalklebsarkom, Monatsschr. f. Ohrenh. 67: 322, 1933.

21. Teubner, K.: Das primäre Carcinom der Trachea, Arch. f. Hals-, Nasen u. Ohrenh. 33: 444, 1933.

22. Adam, J.: Tracheal Tumor, J. Laryng. & Otol. 41: 174, 1926.

23. Bowing, H. H., and Vinson, P. P.: Surgical Diathermy for Tumors of Trachea, Laryngoscope 36: 317, 1926.

5. Schmigelow, E.: Primärer Cancer tracheae, nebst Mitteilung eines durch Resectio tracheal geheilten Falles, Arch. f. Laryng. 22: 18, 1909.

6. Simmel, E.: Zur Kasuistik der primären Carcinom der Trachea, Arch. f. Laryng. 24: 449, 1911.

7. von Bruns, P.: Handbuch der praktischen Chirurgie, Stuttgart, F. Enke, 1913, vol. 2, p. 274.

8. Heymann, P.: Beitrag zur Kenntnis des primären Carcinom der Luftröhre, Ztschr. f. Laryng. 6: 735, 1913-1914.

9. Soerensen, F.: Zwei Fälle von Totalexstirpation der Trachea wegen Carcinom, Arch. f. Laryng. u. Rhin. 29: 188, 1915.

10. Chiari: Chirurgie des Kehlkopfes und der Luftröhre, Stuttgart, F. Enke, 1916.

11. Feichtinger, I. R.: Fall von querer Trachealresection by Ca tracheae, Monatsschr. f. Ohrenh. 61: 182, 1917.

SUMMARY

The American and foreign literature disclose the fact that primary carcinoma of the trachea is a very uncommon disease. With increasing use of endoscopy its presence may be recognized more frequently. Operative procedures, such as removal of a portion of the trachea, have been carried out with varying success. Endoscopic removal of the tumor with x-rays and radium have also been used, but the results have been disappointing.

In the case reported as much as possible of the primary adenocarcinoma of the trachea was removed endoscopically and then intratracheal radium was applied.

Radioactive iodine was used to determine whether any normal or hyperplastic thyroid tissue was present in the tumor.

The patient is well, subjectively and objectively, two years after treatment.

490 Post Street.

THE DERMATOLOGIC ASPECTS OF THE
VESICANT WAR GASES

MAJOR MARION I. JEFF DAVIS

MEDICAL CORPS, ARMY OF THE UNITED STATES

Of 27,111 hospital admissions due to use of poisonous mustard gas during World War I, 30 per cent showed involvement of the skin. This figure is significant and indicates to us, as dermatologists, the necessity of a greater familiarity with this relatively unknown field of war medicine.

Lewisite, one of the arsenical group of gases, is another type of vesicant agent that has been developed since the close of the last war. This discussion will consider experimentation and clinical observations that I have made on the mode of action of these two gases, mustard and lewisite, on human subjects.

MUSTARD GAS

Mustard gas is an aliphatic sulfur compound which in the pure state is a colorless, odorless, moderately volatile liquid whose density is 5.5 times that of air, having a boiling point of 217 C. and a freezing point of 14 C. The plant product, whose formula is bis-beta dichlorodiethyl sulfide ($\text{Cl} \cdot \text{CH}_2 \cdot \text{CH}_2 \cdot \text{S} \cdot \text{CH}_2 \cdot \text{CH}_2 \cdot \text{Cl}$), is used on the field. This is a thick dark brown to black oil characterized by a pungent garlic odor. Owing to its low vapor pressure it may form a persistent heavy mist that remains in the atmosphere for a considerable period after discharge. It is sparingly soluble in water but soluble in organic solvents and organic fats. Oilskin, rubber and cellophane offer some resistance to this synthetic product; ordinary dry clothing and leather afford slight protection, and wet apparel practically none.

Mustard gas acts on the respiratory system and the eyes unless a man is masked; then its chief action is on the skin. There is no pain or irritation on immediate contact with the skin. In a vapor exposure, absorption takes place coincident with the exposure of the skin to the vapors. No mustard gas remains on the skin surface after the exposure is over. In a liquid contamination only a small portion of the mustard gas is

absorbed by the skin, as the vast majority of the gas evaporates into the air unless it is removed by other means.

This agent enters the cuticle presumably by absorption through the epidermis and by penetration of the glandular orifices and hair follicles of the skin surface. The rate and degree of penetration are influenced by such factors as local keratinization, epidermal thickness, supply of gland appendages and variations in the amounts of sweat and sebum present on the glabrous skin. Complete and irreparable damage of cellular tissue takes place within ten to fifteen minutes after liquid contamination of the skin. Most of the mustard gas becomes fixed in the epidermis, while the remainder which is free is transmitted, via the circulation, to various organs of the body.

The exact mechanism involved in the production of vesication and burn by mustard gas is not definitely established. It is the general consensus that the effects of mustard gas are due to a combination of the entire mustard gas molecule with cellular tissue. Precisely what substance or substances of skin the mustard gas combines with is as yet undetermined. However, it is believed to be some protoplasmic protein vital to cell life, perhaps a portion of one of the enzymatic systems.

Mustard gas is insidious in its action. Both the liquid and the vapor are nonirritating to the skin and give no warning. Disabling concentrations of mustard gas vapor may have so little odor that one is not aware of the danger. Likewise, liquid contaminations of the skin or clothing may go unnoticed.

There is a latent period between the time of exposure and the onset of signs and symptoms. This period varies from several hours to several days. Generally, the greater the degree of contamination, the shorter will be the latent period and the greater will be the injury produced. Early skin changes are often preceded or accompanied by nausea or vomiting coupled with a feeling of general exhaustion. In severe exposures these symptoms appear within two or three hours after the initial exposure.

In mild vapor exposures and small liquid splashes, only the exposed skin surfaces are affected. In extensive liquid splashes or more severe vapor exposures there is permeation and penetration of the clothing with the general involvement of the covered portions of the skin. Warm, moist areas of the body are the sites of predilection for mustard vapors: face, neck, axillae, antecubital fossae, groin, genitalia and perineum.

The earliest change in the skin is an erythematous blush often appearing first on the neck, shoulders, arms and legs. Within a few hours there is a generalized bright erythema. The patient presents the appearance of severe sunburn. Bands of normal white skin, which have been protected by thick shoulder straps of an undershirt or the cross belt of a gas mask, streak through these areas of bright erythema.

The appearance of the erythema may be the patient's first indication that he has been burned. There is mild pruritus and prickling of the skin at this time, which increases in severity as the erythema reaches its height. Discomfort becomes more pronounced in the flexural surfaces over the antecubital fossae, neck and popliteal spaces. The skin feels hot and the body temperature may rise to 100 to 102 F.

A generalized brawny edema develops early in this erythematous stage, which is accentuated in severe cases. It may be a superficial edema involving the epidermis or a deep pitting subcutaneous edema. On the extremi-

Major Davis is chief of the Dermatology and Syphilology Section, Cushing General Hospital, Framingham, Mass.

Read before the Section on Dermatology and Syphilology at the Ninety Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

ties, evidence of edema may remain long after the skin itself has returned to normal. The penial and scrotal lesions are often the most severe part of the skin involvement. The scrotum may become the size of a large grapefruit.

Within six to twelve hours, groups of multiple pinpoint vesicles appear. These vesicles soon coalesce to form blebs and bullae of varying size. At times the vesication resembles "crape rubber" or it may assume a ring shape like that of a doughnut.

There is progressive involvement of the skin during the first six to eight days. Pain and discomfort likewise increase in intensity. Sleep is difficult to obtain for the patient despite massive doses of sedatives. By the end of the first week the erythema, vesication and general discomfort reach their peak and begin to subside. Many portions of the skin become raw and denuded. There is weeping, oozing and maceration of some areas followed by fissuring, cracking and superficial ulceration with subsequent crusting. This is particularly true of the flexural surfaces and the genitalia. Eventually the skin becomes dry and parched and assumes a brownish to purplish hue. This deepening of pigmentation continues for a number of days. Desquamation then ensues and continues over a prolonged period. Many portions of the dry epithelium come off in strips and casts much as it does in scarlet fever.

Where liquid mustard gas comes in direct contact with the skin a typical blister develops. The bulla is superficial, round to oval with a thin, translucent, tense roof, and has a glistening golden yellow appearance. Vesication takes place in the center of an erythematous base, so that there is a halo of erythema surrounding the fully developed bulla. There is a wide area of surrounding edema, its extent depending on the degree of burn. The involved area is many times the site of original contamination. In large liquid contaminations the doughnut type of bulla develops. Here one sees a central dull, dirty white area of superficial necrosis surrounded by a ring of vesicle formation of varying width. Here the reaction between mustard gas and the cellular tissue has been so rapid and immediately necrotizing as to prevent the intervening stage of vesicle formation. The vesicle fluid is golden yellow and freely flowing when the early bulla is incised. Later the fluid becomes gelatinous and cannot be aspirated with a large gage needle. The base of the exposed bulla is moist and hemorrhagic. The fluid of an intact bulla or vesicle is reabsorbed within a week.

Lesions, uncomplicated by infection, heal without scar formation. There is characteristically a residual pigmentation due to a melanoblastic stimulation of the basal cells, which requires a number of weeks for resolution. The average case requires a month's hospitalization, the more severe cases several months'.

LEWISITE

Lewisite, a nonmetallic alkyl derivative, was synthesized by the late Dr. Lee Lewis at the American University near the close of the last war.

This gas is as yet untried on the battlefield. The Germans employed ethyldichlorarsine, a similar but less effective arsenical vesicant, during World War I.

Lewisite (beta-chlorovinyl-dichlorarsine) is representative of a group of trivalent arsenical compounds whose vesicant action and highly toxic nature are of prime importance. In its pure state it is a colorless, highly refractive, volatile liquid with no odor. However, it is extremely irritating to the nasal mucosa.

giving rise to coryza, accompanied by sneezing and lacrimation. The impure form used in the field is brownish black with the odor of geraniums. Lewisite boils at 190 C. and freezes at -18 C. It is soluble in organic solvents and sparingly soluble in water. Hydrolysis by water or alkalis yields the corresponding hydroxide or oxide. The latter is one tenth as vesicant as lewisite and nontoxic when applied to the skin.

Liquid lewisite absorbed from the bare skin is capable of producing acute arsenical poisoning and death. From animal experiments it appears that 1 cc. of liquid lewisite absorbed from the skin would be fatal to man. Lewisite combines with certain chemical constituents within the cell. This reaction is reversible during the first few minutes but later becomes an irreversible reaction.

High concentrations of lewisite vapor produce mild vesication. Although lewisite vapor is less effective than that of mustard gas, liquid lewisite causes a more rapid, severe and deeper burn than liquid mustard gas. In contrast to the absence of any symptoms on contact of mustard gas with the skin, lewisite (liquid) produces an almost immediate stinging and burning sensation (ten to twelve seconds).

During the first fifteen to twenty minutes a dull dead white or grayish area appears at the site of contamination. Within several hours the involved site increases in size and there appears an urticaria-like wheal, with central lemon colored area surrounded by a peripheral erythema. This center later becomes blanched in color, with the skin orifices puckering to give the appearance of tanned pigskin. Within six to eight hours pinpoint areas of vesication appear. These gradually coalesce to form a bulla, which covers the entire area of erythema so that early in its formation the underlying erythema sometimes reflects through the bullous roof to give the effect of an iris-like bullous lesion. The peripheral erythema and edema that are characteristic of the mustard gas blister is lacking in the early lewisite burn but appears later. The base of the exposed lesion is exudative, hemorrhagic and raised above the level of the surrounding skin. There is a sharp demarcation between skin involved by the burn and the normal skin, in contrast to the mustard gas burn, in which there is a variable amount of involvement of the adjacent skin.

The lewisite bulla tends to be more opaque and more cloudy than that of mustard gas and may be more flaccid. The vesicle fluid was until recently considered vesicant and to contain sufficient amounts of arsenic to be toxic. I have been able to show both by quantitative chemical analyses and by clinical experiments that the fluid is nonirritant, nonvesicant and nontoxic. In these same experiments it was shown that the vesicle fluid contained only infinitesimal amounts of arsenic (0.001 to 0.002 mg. per cubic centimeter of fluid).

Resolution and healing of a lewisite blister take place in much the same fashion as that of the mustard gas blister. It has been thought by some observers to heal more rapidly than mustard gas burns, but I cannot assent to this opinion. Residual pigmentation in small lewisite burns is not as characteristic as in mustard gas but is often seen to occur in large burns. The lewisite lesion leaves a residual atrophic scar in healing more often than does mustard gas.

PATHOLOGY

A number of factors influence the physiologic action of the vesicants, such as the physical properties of the agent, as well as the concentration and duration of

exposure. The influence of climatic factors on the physiologic action and general cellular activity of the skin are clearly demonstrated in the instance of the vesicant agents. The entire reaction between cellular tissue and the agent is much accelerated by elevations of temperature and humidity. Doses of the vesicants which in the winter produce only a mild erythema result in the hot summer in a burn requiring several weeks to heal.

In the biopsies of mustard gas burns that I have studied the pathologic changes are practically confined to the epidermis. There is a vacuolar or hydropic disintegration of the cells with eventual rupture of the cell membrane. Spaces formed by the progressive liquefaction and disintegration of these cells becomes filled with fluid exudate to produce an intradermal vesicle. The base of this vesicle, which rests on the surface of the corium, presents an occasional remaining basal cell. The roof of the vesicle consists of an upper layer of epidermal cells that remain viable for a time and a lower layer of necrotic or disintegrating cells.

The vesicle contains a homogeneous or fibrillar eosinophilic staining fluid in which there are a few polymorphonuclear leukocytes. Some of the hair follicles appear necrotic for a short distance from the surface, but there are no significant changes of the sebaceous glands, sweat ducts or sweat glands. There is some edema of the superficial corium with capillary dilatation and perivascular edema and mild perivascular infiltration of lymphocytes and polymorphonuclear cells.

In lewisite there is an early complete necrosis of the entire epidermis. This necrotic process extends into the corium, where there is manifest vascular damage and polymorphonuclear infiltration. Vesicle formation is intradermal as in mustard gas lesions, but beneath the vesicle roof there is attached the entire thickness of the necrotic epidermal layer. The pathologic changes in the lewisite lesion are in contrast to the slowly progressive hydropic disintegration confined to the epidermal layer that is seen in mustard gas lesions.

Vesicant burns, while in many respects analogous to those produced by heat and chemicals, offer certain contrasting features. The vesicants do not produce the immediate coagulation necrosis that occurs with thermal, electric and other chemical burns. Again only minute amounts of the agent are necessary to produce severe cellular destruction. Latency, recrudescence and a delayed period of development are peculiar to vesicant burns. With mild contamination, especially of mustard gas vapor, the skin may show no evidence of burn for as long as two to six days after the original contamination when erythema appears. This is an extreme example of the latent period. A vesicant lesion which appears to be properly healing under treatment may show a flare of reactivity ten to fourteen days after the original burn has been inflicted. Such a recrudescence of the burn is usually a papulorhythematous type of eczematous dermatitis occurring about the periphery of the healing burn, which may or may not be associated with vesiculation. Vesicant burns, especially when large portions of the skin are involved, often do not show their maximum involvement for a period of one to several days or more after the patient has presented himself for treatment. Areas of skin which twenty-four hours after the original contamination still appear normal may at a later date become involved, and lesions already present may increase in severity. This clinical observation of the delayed development of vesicant burns is substantiated by pathologic find-

ings. Microscopically there is a prolonged period involved in the development of complete cellular necrosis.

Vesicles have been observed to occur in the old healed scar of vesicant lesions weeks to months after the burn has entirely healed. This phenomenon, at least in my experience, does not occur in thermal burns.

Sensitivity tests performed with very high mustard gas dilutions show the light complexioned to react to a greater degree than the dark skinned or colored individual. However, with sufficiently large exposures these differences disappear. Repeated exposure or burn with mustard gas is capable of producing sensitization to the agent. In a person who has developed this sensitization, an amount of mustard gas sufficient to produce a small burn on the normal skin will result in a very large burn on the sensitive skin. This phenomenon of sensitization from repeated exposures to mustard gas has also been demonstrated by experiments on the pig's skin.

True allergic states have been observed in persons working with mustard gas. In these individuals a fresh mustard gas burn on a previously unburned site of the skin will produce a vesicular reaction at a distant healed site of a mustard gas burn received years previously. These people will also respond to a generalized vapor exposure in a similar fashion. Allergic reactions due to lewisite have been known to occur but are rare.

There is danger of arsenical poisoning from the absorption of lewisite following severe burns, while small mustard gas burns are free from accompanying toxic manifestations. With large areas of skin involved in mustard gas burns, however, there develops a generalized toxemia, hemoconcentration and the other associated signs of shock.

TREATMENT

The emergency prophylactic treatment of vesicant contaminations is the responsibility of the individual soldier. The physician is chiefly concerned with treatment of the burn.

In severe cases the treatment of shock and toxemia is of primary importance. In the mild erythematovesicular cases treatment is the same as that for any acute generalized erythema, i. e. bland lotions and ointments, baths, sedation and so on.

The definitive treatment of vesicant burns differs but little from that usually employed for thermal burns. One may choose almost any of the generally accepted technics of burn treatment which one may prefer.

It has been my experience as well as the experience of others working in this field that the healing time of vesicant lesions is not greatly influenced by the type of therapeutic agent employed except for a few notable exceptions. I have employed ten day occlusive dressings on a large number of burns with a resulting increase of ten days in the healing time as compared with open dressings regardless of the therapeutic agent used in either instance.

The healing time of blisters which were incised and drained was compared with the healing time in blisters which were left intact. There was no difference found in the healing time. However, drainage of the vesicle fluid does give relief to the patient. Amyl salicylate, which in common with other salicylates possesses analgesic properties, has been recommended during the first five or six days of treatment. This is a saturated solution used in the form of a wet dressing. I have employed it in experimental burns of 3 inches diameter.

I have found it to have some analgesic effect in the acute stage, but it does not shorten healing time. Sulfanilamide crystalline powder and sulfonamide ointments appear to have no advantage over a boric acid ointment dressing in the small localized lesions. Workers are in general agreement that escharotics give poor results in vesicant lesions.

There is one major difference between vesicant and thermal burns which must be kept in mind, and that is the delayed period required for the full development of the vesicant lesion. Therapeutic measures and clinical prognosis must in some instances be guided by this fact.

ABSTRACT OF DISCUSSION

COMMANDER ROBERT L. GILMAN (MC), U.S.N.R.: If war gases are never utilized in the present war it will be due in no inconsiderable measure to the Chemical Warfare and allied services, which, in association with civilians and service physicians, have worked so thoroughly on antigas defense, as well as shared in the development of these modern implements of offense. There are certain features in the action of vesicant gases, as pointed out by Major Davis, such as the short but definite period between exposure and the beginning of skin irritation, and the latency or refractory period (in mustard gas) before symptoms appear that dictate to a large extent the measures used in prophylaxis, decontamination and treatment. The clinical and histologic observations of the author and others have been instrumental in outlining rational therapeutic procedures. An additional consideration is concerned with lewisite, and that is that its severity of reaction is due largely more to the contact with the skin of minute liquid droplets than actual gaseous vaporization. This difference in contact and the arsenical content make this gas capable of more severe skin burns as well as toxic systemic effects. We have certain protective devices and prophylactic measures and they are all designed to put an impenetrable curtain between the gas and the man or material. These include protective clothing, ointments and covering material. The latter are protective only in a relative manner. Once material or equipment has been contaminated, considerable effort must ensue if complete salvage is to be obtained. Prophylaxis merges directly into decontamination, which in turn is the first step in treatment. Solvents and soap and water have been mentioned. Action must take place promptly and oftentimes with only the means at hand, such as a thorough dousing or flushing with sea water. The treatment and management in this war will follow proportionally our advantages gained since the last war in the treatment of shock, fluid loss, severe dermatitis and burns. These constitute the major effects of the vesicants, and in the last war these "burn cases" (as they were termed) were treated similarly to any other type of burn casualty. Men were cradled under heat lamps, their beds screened with mosquito netting, while a variety of applications were used locally, ranging from bland ointments to antiseptics, and the use of a variety of "burn specifics." The moderately burned did well, while the severely burned often died of concurrent pneumonia, sepsis or shock. I believe that any future vesicant gas casualties will be treated exactly as we do those of shock or thermal burns at present.

DR. CHARLES C. DENNIE, Kansas City, Mo.: I was a mustard gas officer in the last war. We saw hundreds of cases of mustard gas burns of all degrees of severity. The thing that impressed me most was the fact that these men did not die from mustard gas—only a small percentage of them. Of course, it took them from twenty-four to seventy-two hours to arrive at our hospital, and the ones who were going to die probably died before that time. They manifested all degrees of burns, and about 10 per cent of the total number of casualties were severe burns. The thing that struck me most forcibly was the gelatinous material that was secreted beneath the giant vesicles. Some of these were blebs; some were as much as a foot long and 8 inches wide and would cover both thighs and the buttocks. Most of the casualties occurred during July and August, when the weather was hot and when there was dense

humidity in the air. A great many of these men wore defective gas masks and they got an interstitial keratitis, which took much longer to cure than an original gas burn. They had all the manifestations of interstitial keratitis of syphilitic origin, including photophobia. They also, when they had defective gas masks, developed a severe burn of the upper respiratory tract in such a manner that they coughed up membranes a great deal like diphtheritic membranes, and in a few cases diphtheria was a complication. In treatment, we used only transfusions in those days; such a thing as using serum or plasma was unknown. Yet these men whom I saw, 12 of them in that first group of cases, lost much plasma but did not die from plasma loss. With the large vesicles we could take the gloved hand and throw the plasma off on the ground. In those cases the plasma had to be removed. We didn't know what to do with them, so we washed them with salt water and then we found after a little experimentation that the thing that gave the most case was 2 per cent sodium bicarbonate in petrolatum.

DR. LEON GOLDMAN, Cincinnati: The remarks of some one who has had practical experience in this field are a lot more important than those of us who work in the experimental laboratory or had just a lot of library experience. One of the points that Major Davis brought up in his paper was the fact that a molecular intact mustard agent can be isolated from the lower layers of the skin and also found in the blood vessels away from the skin lesion. This is rather important for us who work in civilian dermatology because the principles of the study of these penetrating, persistent, equally strong irritant and sensitizing agents can be carried over into experimental work in civilian dermatology. With what he has told us about mustard gas and with the remarks of Dr. Cowdry a few days ago on the dynamic morphologic anatomy of the skin, we can really find out the fate of many of our contact agents in the skin. I should like to ask Major Davis if he has had any experience with cross sensitization between mustard gas and the less irritant but much more dangerous systemic agents, the so-called nitrogen mustards. From my work I can substantiate the findings of Major Davis and also of Sulzberger and Katz that the lewisite blister fluid is not irritant to the skin and also the roof over the lewisite blister is certainly not dangerous to the skin and contains little, if any, arsenic. I am curious to know what happens to 30 plus arsenic which has been deposited in the skin from lewisite agent. I have tried to find it by sulfide staining technics and am certainly not satisfied. Another point is the observation of Major Davis about the late appearance of vesicles in old scars, which I do not believe has been noted before in contact dermatitis. I have seen this phenomenon in old burns, especially in old stasis scars and in postoperative breast amputation scars, but there I have assumed that these fluid collections were due to mechanical trauma. I wonder if Major Davis can say anything about the value of protective ointments in the immediate emergency. All of us are concerned about whether there are such things as true protective ointments, as for instance in industrial dermatology. I should like to ask Major Davis too if he can say something of his important work in the field of antiarsenical agents as related to lewisite poisoning, since many dermatologists are concerned with arsenical reactions.

DR. C. GUY LANE, Boston: I have seen a few research workers with mustard gas and a few who are developing gas proof fabrics. One of these workers showed an interesting feature. She was working in front of a hood, where the fan was not turned on. The manager of the plant was beside her and another worker on the other side of her. She was handling some mustard gas just in front of her. She came to me about a week later with a mustard gas burn on the lower part of the abdomen, involving the pubic region and inner thighs, which was quite disturbing for several weeks. Curiously enough, on the lower part of the abdomen it was easy to see the markings of her girdle, where the gas had apparently penetrated. She was perfectly unconscious of anything going on at the time. It is important for workers to follow absolutely directions about protection. It is also important for them not to use too strong a solution to neutralize the mustard gas. There were several cases in a group that thought that because the routine strength of the neutralizing agent was good a stronger solution would

be much better. Their manifestations did not suggest mustard gas and disappeared when the solutions were used in normal strength.

MAJOR MARION I. JEFF DAVIS, M. C., A. U. S.: The soldier is supplied with two types of prophylaxis against vesicant agents. One is used as a prophylactic against the mustard gas agent and there is also one used as a prophylactic against lewisite burns. These are ointments. They have to be applied rapidly after contamination. If they are applied within a few minutes after contamination they work well particularly in the case of lewisite. This prophylactic agent for lewisite has a specific action and is capable of reversing the lewisite reaction with the cellular tissue up to a given time after contamination. The principle involved in this ointment and its formula are not divulged; however, it has now been distributed to several clinics throughout the country; the active principle is being used in the treatment of toxic arsenical reactions. Severe arsenical dermatitides have been treated with this agent successfully. It is put up in the form of an intramuscular injection and used as an injection four times a day during the first day and once daily thereafter for the next five days. The reports have been received that this agent has actually saved patients' lives who have developed severe arsenical dermatitis which otherwise would probably have resulted in death. The investigative work included in this paper brings out perhaps one important feature: the need for a great deal of further work in burns. The pathology of burns, the mechanism of vesiculation and the therapy of burns are fields in which the dermatologist has an opportunity to contribute his share.

METABOLIC CRANIOPATHY

A CLINICAL AND ROENTGENOLOGIC STUDY OF SO-CALLED HYPEROSTOSIS FRONTALIS INTERNA

ARTHUR GROLLMAN, M.D., PH.D.

DALLAS, TEXAS

AND

J. P. ROUSSEAU, M.D.

WINSTON-SALEM, N. C.

Metabolic craniopathy has been defined as "a syndrome characterized clinically by variable and protean manifestations of a metabolic, endocrine and neuropsychiatric nature and roentgenologically by characteristic thickening of the internal tables of the skull."¹ The condition has been commonly referred to as hyperostosis frontalis interna, but this is a less suitable designation since the changes observed in the skull do not appear to contribute to the clinical picture nor are they probably an essential part of the syndrome. The changes in the skull are moreover not always limited to the frontal bones, and hence the designation metabolic craniopathy would appear preferable. Other designations which have been used for certain forms of this disorder are the eponyms Morgagni's and Stewart-Morel's syndrome and the terms "cranial hyperostosis of the insane" and "calvarial hyperostosis." These too fit the condition less satisfactorily, however, than does the designation metabolic craniopathy.

Although metabolic craniopathy is a relatively common condition, found in about 1 to 2 per cent of all patients admitted to hospitals, it is only since 1928 that the condition has been recognized as a clinical entity. In that year Stewart² described 5 patients with unusual

clinical features who at autopsy were found to have hyperostosis of the skull. He drew attention to the association of mental symptoms and obesity with the observed localized cranial hyperostosis. Moore's³ survey of 6,650 x-ray films of the skull clarified the roentgenologic aspects of the disorder, established criteria for its diagnosis and clarified the confusing roentgenographic findings in the several types of cranial exostoses, puerperal osteophytes and senile hyperostosis and established our present concept of the pathognomonic bone changes in metabolic craniopathy as seen on x-ray examinations. Since Stewart's publication,² over 100 cases have been reported in the world literature.

CLINICAL MATERIAL AND METHODS

The present paper is based on a survey of the patients seen at the North Carolina Baptist Hospital. During the two and one-half year period between July 1941 and January 1944, approximately 1,620 examinations of the skull were carried out in the Department of Roentgenology for one cause or another. Of these, 78, or 4.1 per cent, revealed the presence of calvarial hyperostosis pathognomonic of metabolic craniopathy. Many of these patients were outpatients referred by physicians for x-ray study only and hence were not available for clinical study. In the vast majority of the cases an x-ray examination of the skull was requested because of unexplained headache. Disease of the sinuses and intracranial tumor were the disorders most often suspected by the referring physician. In less than 5 per cent of the cases was the true nature of the disorder suspected.

The clinical data presented in the present paper are based on an analysis of 40 patients in whom the diagnosis, as suggested by the history, physical examination and laboratory studies, was confirmed by the x-ray findings.⁴ In addition 2 patients were encountered with clinical findings typical of the disorder but without the pathognomonic x-ray evidence of the characteristic hyperostosis. It is now generally conceded that the changes in the skull are merely one characteristic of the disease and need not be present. Nevertheless, the objective x-ray findings remain to date the most constant and reliable and the characteristic feature of the disorder.

INCIDENCE

As has already been noted, the incidence of calvarial hyperostosis in our series of x-ray films of the skull was 4.1 per cent. This is considerably higher than that reported by Moore³ (1.2 per cent) but lower than that noted by Eldridge and Holm⁵ (25 per cent) in patients admitted to an insane asylum.

The 42 patients whom we have studied clinically were encountered among a total of 4,200 individuals seen in the medical services of the North Carolina Baptist Hospital. The incidence of the disorder is thus approximately 1.0 per cent in a general hospital population. Metabolic craniopathy is thus far from being a rare condition.

AGE

The age distribution of our patients has been as follows: ages 20 to 29, 5; 30 to 39, 10; 40 to 49, 16; 50 to 59, 5; 60 to 69, 4. More than a third of the

From the Departments of Roentgenology and Internal Medicine of the Bowman Gray School of Medicine of Wake Forest College and the North Carolina Baptist Hospital.

1. Grollman, A.: Diseases of the Bones, in Christian, H. A., and Mackenzie, J.: Oxford Medicine, New York, Oxford University Press, 1943, vol. 4, chapter 2, pp. 405-502.

2. Stewart, R. M.: Localized Cranial Hyperostosis in the Insane, J. Neurol. & Psychopath., 8: 321, 1928.

3. Moore, S.: Hyperostosis Frontalis Interna, Surg., Gynec. & Obst. 61: 345, 1935; Metabolic Craniopathy, Am. J. Roentgenol. 35: 30, 1936; Calvarial Hyperostosis and the Accompanying Symptom Complex, Arch. Neurol. & Psychiat. 35: 975 (May) 1936.

4. Drs. Wingate M. Johnson, Elbert MacMillan and R. L. McMillan gave us permission to study and include 4 of their patients in this series.

5. Eldridge, W. W., and Holm, G. A.: The Incidence of Hyperostosis Frontalis Interna in Female Patients Admitted to a Mental Hospital, Am. J. Roentgenol. 43: 356, 1940.

patients were thus in the fifth decade of life when they first presented themselves for diagnosis, although in most cases the symptoms had been present for many years. The youngest of our patients was aged 21. The disease apparently, judging from the history, has a slow and insidious onset and probably begins in early life. The youngest patient on record in whom hyperostosis was evidenced in the x-ray film was aged 7, and in 5 of our own cases the changes in the skull were pronounced before the age of 30. In most cases, however, the condition is a disorder of middle life.

SEX

The condition, as has been pointed out by all previous observers, is predominantly one affecting the female sex. Only 1 of our patients was a man. This compares with the results of previous observers,⁶ who also



Fig 1.—A 49 year old patient showing the typical obesity of metabolic craniopathy. The principal symptom of complaint was intractable headache. Note the megalomastia and rhizomelic type of obesity often erroneously referred to as "pituitary obesity."

found that 97 to 98 per cent of the patients were women. The 1 male patient in our series was a 33 year old salesman who complained of trembling, nervousness, insomnia, periodic attacks of blindness and generalized weakness. Physical examination was entirely negative except for bilateral megalomastia, which, according to the patient, was a familial characteristic shared by several other male members of his family.

HEREDITY

Metabolic craniopathy frequently affects several members of the same family, being inherited as a dominant character.⁷ The family history of a number of our patients suggested the existence of the disorder in their

relatives. In one instance the x-ray examination of the skull of a paternal uncle (an inmate of a mental asylum) of one of our patients revealed the existence of the disease.

SYMPTOMATOLOGY

The symptoms of metabolic craniopathy are protean and variable. They consist of metabolic, endocrine, hypertensive and neuropsychiatric manifestations. Although only one of these general groups of symptoms may be predominant in any individual case, there are usually manifestations of at least two or more of them. In our series of 42 patients, 14 showed manifestations of neuropsychiatric, metabolic and endocrine dysfunction. In 13 the neuropsychiatric manifestations alone were outstanding. In 8 a combination of neuropsychiatric and metabolic abnormalities were predominant. In 5 cases neuropsychiatric and endocrine disturbances were outstanding. In the remaining 2 cases the changes in the skull were merely an incidental finding, and it was only on questioning that evidence of neuropsychiatric manifestations was elicited. One of these patients was brought to the hospital by hypertensive cardiovascular disease and chronic nephritis, where she died of uremia. The hyperostosis of the other patient was discovered incidentally during the study of a control series of 50 female patients in the fifth decade of life to determine the incidence of calvarial hyperostosis in the general hospital population. Her principal complaint was due to chronic cholecystitis.

Metabolic Disturbances.—The principal metabolic disturbance noted in this condition is obesity. This was observed in 23 of the 42 cases covered in this report. The obesity is usually of the rhizomelic type with megalomastia, which has so frequently but without any rational basis been designated as the "pituitary" type of obesity (fig. 1).

Basal metabolic determinations varied in most cases within plus or minus 10 per cent of the normal. In only 2 cases did the basal metabolic rate deviate beyond these figures, being minus 15 per cent in 1 case and minus 18 per cent in another. There was no evidence of hypothyroidism in these cases.

The blood cholesterol, which was determined in 18 of the cases, was within normal limits (180 to 220 mg. per hundred cubic centimeters).

There was no evidence of any disturbance in the calcium and phosphorus metabolism. The blood levels of the serum calcium and inorganic phosphate were normal in the 26 instances in which these determinations were made.

Hyperglycemia is considered by Bartelheimer⁸ as a symptom of hypophysial diabetes in hyperostosis frontalis interna, but in our series of patients this was encountered in only 3 instances. In 2 of these the glycosuria was mild and was controlled by dietary restriction. In the other 3 there was relative refractoriness to insulin, and large doses did not effectively control the hyperglycemia. In 12 other patients in whom obesity was a prominent symptom the dextrose tolerance did not differ from that observed in otherwise normal obese individuals.⁹

Endocrine Disturbances.—Approximately one half of all the patients in our series have manifested some disturbance usually attributed to the endocrine organ-

⁶ Grollman¹, Eldridge and Holm²,
⁷ Knies, P. T., and Lelover, H. E.: Metabolic Craniopathy: Hyperostosis Frontalis Interna, *Ann. Int. Med.* 14: 1858, 1938. Samson, M.; Caron, S., and Martin, C. A.: Syndrome d'hyperostose frontale interne a caractere familial, *Laval med.* 7: 140, 1942.

⁸ Bartelheimer, H.: Die Hyperostosis frontalis interna als Symptom des hypophysären Diabetes Deutsche med. Wochenschr. 65: 1129, 1939.
⁹ Grollman, A.: Essentials of Endocrinology, Philadelphia: J. B. Lippincott Company, 1941.

The principal endocrine disturbances were related to the reproductive system, with abnormalities of menstruation not associated with any demonstrable pelvic disease. In 9 of the patients, amenorrhea was outspoken. The menarche usually occurred normally, but gradual cessation of the menses began at the age of 18 or 20 and in some instances the amenorrhea had continued over a period of many years.

Hirsutism (fig. 2) is the other prominent manifestation which we have encountered in 12 of the 42 cases. Since these symptoms are usually associated with obesity and hypertension, one can readily see how this condition might mistakenly be diagnosed as the Cushing syndrome. As a matter of fact this diagnosis had been made elsewhere in 2 of the cases in this series and in 1 case an exploration of the adrenals had been carried out.

Hypertension.—Hypertension identical to that seen in benign hypertensive cardiovascular disease has been observed in 16 of our 42 patients. This is a much higher frequency than one would expect if the hypertension was merely a coincidental occurrence, and we therefore believe that this represents another of the protean manifestations of the disease.

Neuropsychiatric Disturbances.—Neuropsychiatric manifestations constitute the most prevalent symptoms observed, being present in over three fourths of all patients. In 30 of our 42 patients a diagnosis of psychoneurosis had been made at some time during the patient's life.

The neuropsychiatric manifestations did not conform to any specific syndrome. This fact has also been noted by Eldridge and Holm,⁸ who observed in their patients thirteen of the twenty-two types of psychosis recognized by the American Psychiatric Association. Schiff and Trelles¹⁰ describe the neuropsychiatric disturbances observed in hyperostosis frontalis as consisting of (1) intellectual slowness with depression and anxiety, (2) disturbances of temperament and character and (3) protective neuroses. Personality changes, egocentricity, hypochondriasis, general nervousness and the other usual psychoneurotic manifestations are commonly observed. Easy fatigability, muscle weakness, dimness of vision, diplopia, dizziness (without any evidence of ocular disease) and subjective disturbances in gait and equilibrium are frequent complaints. Cranial nerve defects, narcolepsy, convulsive seizures, mental deterioration and dementia are less common manifestations.

Headache was a very common complaint, being present in 19 of the 42 patients of our series. It is commonly frontal but may be occipital or may be referred to the top of the head or to the nuchal area. In several cases the headache was disabling and was the principal complaint. The refractoriness of this headache to the usual methods of therapy is striking. In the more severe cases ergotamine tartrate, aminopyrine and the other usual preparations were found to be ineffective.

Major psychoses are common in patients suffering from metabolic craniopathy. Four of our patients had

at some time required institutional confinement. These patients were suffering from depression.

Hysteria, with diverse manifestations, is frequently observed in metabolic craniopathy and was noted in 8 of our patients. In 1 the conversion hysteria was of the paralytic type, with hysterical paralysis and anesthesia of the left lower extremity. In 2 patients there were attacks of periodic blindness and in 2 periodic deafness, apparently hysterical in origin. One patient suffered from chronic attacks of jacksonian epilepsy. Another patient gave a history of a single acute attack of convulsions and coma lasting for several days. Somnolence was a symptom in 2 patients, dizziness and fainting spells in 3.

ROENTGENOLOGIC CONSIDERATIONS

We have found positive bone changes in the skull in 98 per cent of the patients in whom typical clinical symptoms were present. In practically every patient with the usual endocrine, metabolic and neuropsychiatric

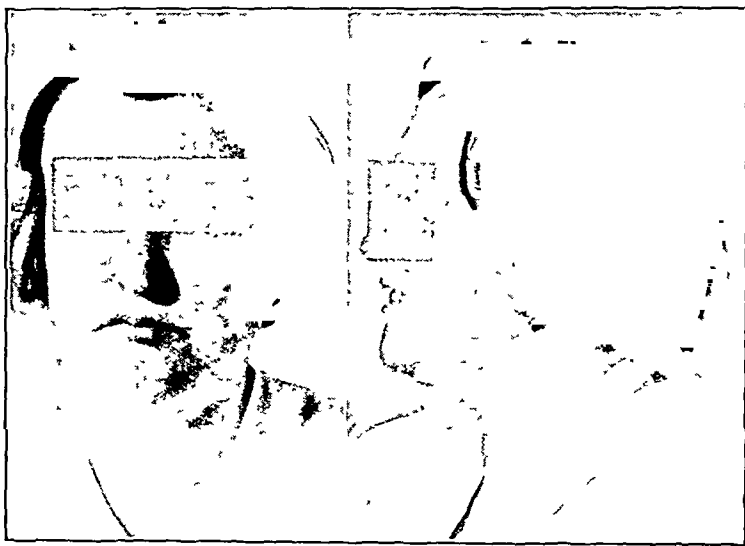


Fig. 2.—A 39 year old patient with metabolic craniopathy. Note the facial hirsutism often seen in this disorder. In addition the patient manifested the typical obesity, hysterical paralysis of the left leg, and amenorrhea of ten years' duration.

manifestations of the disease, pathognomonic bone changes in the vault can be demonstrated on the roentgenogram. The failure to see typical bone changes, however, does not exclude the possibility of the syndrome, as clinicians interested in this disease can with careful study arrive at a diagnosis in a small percentage of cases on the basis of clinical findings alone. There are also a certain number in whom typical x-ray changes are demonstrated and in whom subsequent clinical investigations fail to elicit the expected symptoms. We feel that in all probability these patients will in time develop clinical manifestations, but we have no proof of this nor do we know how soon after x-ray bone changes occur such manifestations will develop, since our observations have been over too short a period of time.

The characteristic x-ray changes consist essentially in the deposition of cancellous bone of great density on the inner table of the frontal bone (fig. 3). This formation consists of benign noninflammatory osseous tissue, affecting primarily the compact bone of the inner table. In a small percentage of cases it will later involve the diploe between the tables (fig. 4). In

10 Schiff, P. and Trelles, J. O : Syndrome de Stewart Morel (hyperostose frontale interne avec adipose et trouble mental) d'origine traumatique, *Encephale* 24 : 768, 1931.

the majority of the cases the lesion is entirely limited to the squama frontalis, the condition which we recognize as typical hyperostosis frontalis interna. Occasionally there is involvement of the orbital plate of the frontal bone, the inner table of the parietal bone or, less commonly, the structures in the middle fossa at the base of the skull, especially the temporal or sphenoid bone and the bony structures of the hypophysial fossa (fig. 5). Diffuse calvarial hyperostosis involving the entire vault has been reported by Moore,³ and Schiller¹¹ has reported extracalvarial bone changes in the mandibles. In none of our cases were changes demonstrated outside the calvarium. Knies and Lefever⁷ feel that distinction between the various subgroups as outlined by Moore is somewhat arbitrary and that care must be exercised lest thought become more confused rather than simplified.

In none of our cases were remote hyperostotic bone changes unassociated with the characteristic changes of the frontal bone found in the vault. We feel that in

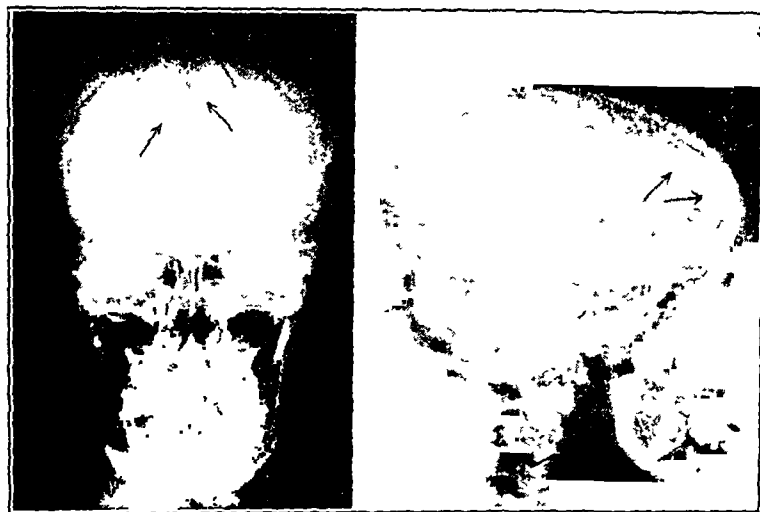


Fig. 3.—Posteroanterior and lateral appearance of the skull in a case of metabolic craniopathy showing the typical deposition of cancellous bone on the inner table of the frontal bone.

all cases showing the classic x-ray appearance the inner table of the frontal bone is primarily involved and that in approximately 2 per cent of these lesions will be seen elsewhere in the vault. In all cases there is thickening and sclerosis of the inner table of the frontal bone, which, in some cases, may be as great as 3 to 5 cm. in thickness (fig. 6). The outer table is always spared and the external diameter of the calvarium is not altered. Usually the changes are bilateral and symmetrical. From these observations we may perhaps be justified in concluding that the x-ray evidence of metabolic craniopathy is hyperostosis frontalis interna and that changes remote from the frontal bone represent secondary variations of this primary change.

If this criterion is adhered to, the differential diagnosis of this syndrome from the hyperostoses associated with acromegaly, osteitis deformans, tuberculous and syphilitic osteomyelitis, leontiasis ossea, cranial osteoma, sarcoma, metastatic cancer, underlying hemispherical meningioma and senile hyperostosis will become less difficult and this condition may be diagnosed with a high degree of accuracy on roentgenologic evidence alone.

11. Schiller, A.: *Roentgen Diagnosis of Diseases of the Head*, translated by T. P. Stocking, St. Louis, C. V. Mosby Company, 1918.

DIFFERENTIAL DIAGNOSIS

Because of the neuropsychiatric manifestations of metabolic craniopathy the condition is frequently diagnosed as "psychoneurosis."

The obesity, hypertension, hirsutism and amenorrhea often lead to the diagnosis of Cushing's syndrome. There should, however, be no cause for confusion between the two conditions, since patients with metabolic craniopathy lack many of the outstanding features of true Cushing's disease. One does not observe in metabolic craniopathy the osteopetrosis, acrocyanosis and purplish striae which are characteristic of Cushing's syndrome.¹² Moreover, the course of the disease in the two conditions is entirely different, being rapidly progressive in Cushing's syndrome and relatively chronic without rapid progression in metabolic craniopathy. Except for the hirsutism, there is no evidence of true masculinization in metabolic craniopathy. One does not find an enlargement of the clitoris or the masculine voice observed in most patients with androgenic tumors of the adrenal gland or with arrhenoblastoma.

The 17-ketosteroid content of the urine has been shown to be of considerable significance in the diagnosis of Cushing's syndrome and disorders of the adrenal cortex. It was thought, therefore, of interest to investigate the excretion of this steroid in the urine of patients suffering from metabolic craniopathy in whom amenorrhea and hirsutism were prominent features and in whom one might therefore suspect some abnormal androgenic activity of the adrenal cortex. In 10 patients on whom such studies were made the daily 17-ketosteroid excretion was 3 to 7 mg. This is entirely within the normal limit. Such determinations might be useful as an added laboratory aid in the differential diagnosis.

TREATMENT

Metabolic craniopathy is a progressive chronic disorder, the more severe cases terminating at times in actual dementia. The majority of the cases, however, show little progression, with long continued morbidity. In most of our patients, symptoms had been present over a period of from two to fifteen years.

Among the various forms of therapy which have been suggested are the administration of chondroitin, aminoacetic acid or anterior pituitary and irradiation of the pituitary-hypothalamic area. In our own experience no form of therapy has proved of any demonstrable permanent value, and any apparent beneficent effect has probably been the result of suggestion. In several of our patients in whom the pituitary-hypothalamic area was irradiated striking improvement has occurred, but in other cases this form of therapy has been of no apparent value. In most cases the obesity has been controlled by dietary restriction, but in many cases, even on a low caloric diet, loss in weight has been minimal.

COMMENT

It has been questioned whether hyperostosis frontalis interna represents a real clinical entity.¹ Because of the chronic nature of the disease, few of the patients have come to autopsy and hence there is lacking any

12. Grollman: *Essentials of Endocrinology*, pp. 82-83

pathologic basis to which one might attribute the disorder. From a clinical standpoint we believe, however, that the disease does represent a definite entity, which when taken in conjunction with the specific roentgeno-



Fig 4—Appearance of the skull in a case of metabolic craniopathy, showing the involvement of the diploe between the tables in addition to changes on the inner table of the frontal bone and wings of the sphenoid

logic findings may be differentiated as a distinct disease process.

As regards the pathogenesis of the disorder, the nature of its symptoms would lead one to assume that the basic disorder is in the hypothalamic area of the brain. This portion of the diencephalon could give rise to the diverse symptomatology and protean manifestations which one observes in metabolic craniopathy.



Fig 5—A case of metabolic craniopathy with involvement of the inner table of the frontal bone, the structures of the middle fossa at the base of the skull, and the squamous portion of the temporal bone

Further pathologic studies, however, are necessary before this hypothesis can be established.

In a few cases reported in the literature cerebral degeneration in the form of cortical atrophy has been

demonstrated.¹³ Although several authors have pointed to the endocrine features of the disease as evidence of an endocrinopathy being the basis for the disorder, there is no proof to support this view. In the 2 patients of our series who have come to autopsy no abnormalities of the pituitary, thyroid or adrenals could be demonstrated.

SUMMARY

1. A study was made of 42 patients suffering from metabolic craniopathy.

2. X-ray findings in 78 patients manifesting the disorder and in a control series of 50 patients were investigated in order to establish the roentgenologic basis for the diagnosis.

3. The 17-ketosteroid excretion in patients with metabolic craniopathy displaying metabolic and endocrine disturbances has been shown to be normal. In patients



Fig 6—Hyperostosis of the frontal bone and diploe, the new bone deposit being 4 cm. in thickness

with similar symptoms which are due to adrenal cortical dysfunction, the 17-ketosteroid content of the urine is elevated.

4. Metabolic craniopathy is considered to be a definite clinical entity of relatively frequent occurrence.

13. Moore, M. T.: The Morgagni Stewart Morel Syndrome: Report of a Case with Pneumoencephalographic Findings, *Arch. Int. Med.* 73:7 (Jan.) 1944

Fluid Structures of the Body.—The fluid structures of the body consist of three parts, the blood, the intracellular fluid and the interstitial fluid, the sum total of which constitutes 70 per cent of the body mass. Of this, 5 per cent of the body weight (35 liters in a person of 70 Kg.) is circulating plasma, 50 per cent (35 liters) intracellular fluid and 15 per cent (10.5 liters) interstitial fluid. This last, which includes the lymph, is the most labile of the three, for in order to preserve intact the other two it must undergo a constant shift in amount and, to a less extent, in electrolyte content.—McLester, James S.: *Nutrition and Diet in Health and Disease*, Philadelphia, W. B. Saunders Company, 1943.

HYPERTENSION

THE EFFECT OF ACTIVITY, REST, NATURAL SLEEP, SODIUM AMYTAL, PENTOTHAL SODIUM, CHLORALOSE AND ETHER ON EXPERIMENTAL NEUROGENIC HYPERTENSION AND OF REST AND SODIUM AMYTAL AND ANESTHESIA ON HYPERTENSIVE PATIENTS

KEITH S. GRIMSON, M.D.

CHARLES E. KERNODLE JR., M.D.

AND

HENRY C. HILL, M.S.

DURHAM, N. C.

Restriction of activity, extension of periods of rest and natural sleep, and generous use of sedatives are commonly employed in the medical treatment of hypertension. Splanchnicectomy (Peet,¹ Craig and Adson,² Smithwick³ and others) or subtotal to total paravertebral sympathectomy, splanchnicectomy and celiac ganglionectomy (Grimson⁴) have been of value as occasional supplements to medical management. Selection of patients for surgery has proved difficult. The effect of rest and sodium amytal on hypertension determined by hourly blood pressure readings during twenty-four hours or more has been emphasized by many physicians as one of several important factors indicating the advisability of surgery.

Vasomotor instability evidenced by abnormal elevations of blood pressure during reflex or emotional stimulation has long been recognized in many patients and associated with the term "neurogenic hypertension." The function of the sympathetic nervous system in mediating such elevations of blood pressure and the important role of the carotid sinuses and cardioaortic depressor nerves in regulating blood pressure have been reviewed.⁵ Heymans and Bouckaert⁶ in 1931 presented the first of a series of studies demonstrating that elimination of the modulating function of the depressor nerves produces vasomotor instability and a persistent neurogenic hypertension in dogs. Similar studies by Koch and Mies,⁷ Dautrebande,⁸ Nowak and Walker,⁹ Thomas and Warthin,¹⁰ Grimson¹¹ and Schafer¹² have been reviewed.⁵ Total sympathectomy effec-

tively reduces experimental neurogenic hypertension. Splanchnicectomy alone does not. The fundamental observations of Goldblatt and his colleagues¹³ in 1934 initiated an extensive investigation of renal factors in hypertension. These studies have afforded little encouragement for sympathectomy and have not yet produced a satisfactory therapeutic agent.

The nature of the hypertensive disease process present in many patients is obscure. We feel that elements of abnormal blood pressure regulation, abnormal renal function and vascular pathologic conditions, together with other factors as yet unknown, may all be present in many hypertensive patients in varying degrees. We also feel that in some patients faulty blood pressure regulation or a neurogenic element may be an initiating and a major perpetuating factor. The disturbed pressor depressor equilibrium of such patients would effect through the sympathetic nervous system an increase of peripheral resistance throughout the body. Subsequent vascular disease and renal humoral or metabolic change would also affect the entire vascular bed. Should medical management fail in hypertension of this variety, surgical intervention would be indicated. The effectiveness of sympathectomy should increase as it is extended from the original limited splanchnicectomies to include more or all of the body. A test that could determine the presence of a neurogenic element would be valuable.

Because of these several considerations we feel that this experimental study of the effect of activity, rest, sedation and anesthesia on experimental neurogenic hypertension in dogs is warranted.

ACTIVITY, REST AND NATURAL SLEEP

The technics conventionally employed for blood pressure determination in dogs require positioning and training and preclude determinations during normal emotional and physical activity, rest and natural sleep. We¹⁴ have devised a technic that employs small sterile buried iliac and femoral cuffs and pressure sacs connected through fine plastic tubing to a pressure mercury and a recording water manometer. This technic permits pulse rate and mean systolic blood pressure determination at any desired moment without disturbing the animal. The average and the range of the blood pressures of 4 normal dogs were determined during varying stages of activity and during natural sleep. Two typical responses are represented in figure 1. The blood pressure and pulse average and range were elevated during activity and low during rest and natural sleep. Neurogenic hypertension was developed in 4 dogs by excision of the carotid sinuses and division of the vago-depressor-sympathetic trunk of one side and the depressor nerve of the opposite side. The blood pressure range and average of two of these dogs is represented in figure 2. It is evident that fluctuations of blood pressures during various stages of activity exceeded those observed in the normal dog. The blood pressures during rest and natural sleep of 3 of the 4 neurogenic hypertension dogs were lower than the active blood pressures but higher than similar pressures in the normal dogs (fig. 1). One of the 4 dogs (dog 2, fig. 2) had no reduction of the hypertension during

From the Department of Surgery, Duke University School of Medicine. Read before the Section on Surgery, General and Abdominal, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, July 14, 1944.

1. Peet, M. M.: Splanchnic Section for Hypertension: Preliminary Report, Univ. Hosp. Bull., Ann Arbor **1**: 17-18, 1935.

2. Craig, W. M., and Adson, A. W.: Hypertension and Subdiaphragmatic Sympathetic Denervation, Surg. Clin. North America **19**: 969-980, 1939.

3. Smithwick, R. H.: Technic for Splanchnic Resection for Hypertension. Preliminary Report, Surgery **7**: 1-8, 1940.

4. Grimson, K. S.: Total Thoracic and Partial to Total Lumbar Sympathectomy and Celiac Ganglionectomy in Treatment of Hypertension, Ann. Surg. **114**: 753-775, 1941.

5. Grimson, K. S.: Sympathetic Nervous System in Neurogenic and Renal Hypertension: Experimental Correlation and Clinical Consideration, Arch. Surg. **43**: 284-305 (Aug.) 1941.

6. Heymans, C., and Bouckaert, J. J.: Observation chez le chien en hypertension artérielle chronique et expérimentale, Compt. rend. Soc. de biol. **106**: 471-473, 1931.

7. Koch, E., and Mies, H.: Chronischer arterieller Hochdruck durch experimentelle Dauererschaltung des Blutdruckzüglers, Krankheitsforschung **7**: 241-256, 1929.

8. Dautrebande, L.: Réactions vasomotrices à l'oxygène et l'acide carbonique chez le chien en hypertension artérielle par enervation des zones vasosensibles, Arch. internat. de pharmacodyn. et de thérapie **40**: 107-114, 1931.

9. Nowak, S. J. G., and Walker, I. J.: Experimental Studies Concerning Nature of Hypertension: Their Bearing on Surgical Treatment, New England J. Med. **220**: 269-274, 1939.

10. Thomas, C. B., and Warthin, T. A.: Response of Normal Dogs and Dogs with Experimental Hypertension to Standard Cold Stimulus, Am. Heart J. **19**: 316-329, 1940.

11. Grimson, K. S.: Role of Sympathetic Nervous System in Experimental Neurogenic Hypertension, Proc. Soc. Exper. Biol. & Med. **41**: 219-221, 1940.

12. Schafer, P. W.: Body Fluid Changes in Neurogenic Hypertension and Total Paravertebral Sympathectomy, Proc. Soc. Exper. Biol. & Med. **49**: 327-329, 1942.

13. Goldblatt, H.; Lynch, J.; Hanzal, R. F., and Summerville, W. W.: Studies on Experimental Hypertension: Production of Persistent Elevation of Systolic Blood Pressure by Means of Renal Ischemia, J. Exper. Med. **59**: 347-379, 1934.

14. Kernodle, C. E., Jr.; Hill, H. C., and Grimson, K. S.: Experimental Technic for Measuring Mean Systolic Blood Pressure During Activity, Rest and Natural Sleep, Proc. Soc. Exper. Biol. & Med. **55**: 64-66, 1944.

sleep. The pulse rates of the neurogenic hypertension dogs exceeded those of the controls and fluctuated more widely with variations of activity.

SODIUM AMYTAL AND PENTOTHAL SODIUM

The effect of sodium amytal on blood pressure was observed in 5 normal and 6 neurogenic hypertension dogs. The sodium amytal was given in divided doses during three or four hours in amounts averaging in all 0.2 Gm. per dog. This produced light sleep. The blood pressures were taken before and after the sodium amytal by direct arterial puncture. The positioning of the dog for arterial puncture after sodium amytal produced some restlessness. The neurogenic hypertension dogs employed had been prepared by elimination of the modulator or depressor nerves as described some three months before the experiment. The effect of the sedative on the blood pressure is illustrated in figure 3. An elevation occurred in 2 of the control animals, a lowering in 2 and no appreciable change in 2. An elevation occurred in 2 of the neurogenic hypertension dogs, a lowering in 3 and no change in 1.

The effect of pentothal sodium anesthesia was determined on 5 normal, 6 neurogenic hypertension and

in 3. It rose in 1 of the neurogenic hypertension group and dropped in 5. The final blood pressures of these 5 remained at definite hypertension levels. It rose in 3, dropped in 3 and remained unchanged in 1 of the renal hypertension animals.

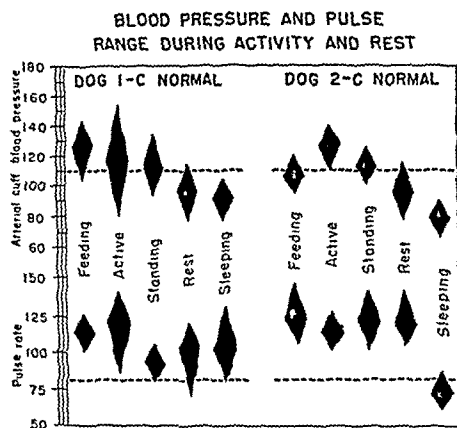


Fig. 1.—Blood pressure and pulse range of 2 normal dogs. The pressures were obtained by an arterial cuff technique without disturbing the animals. Some lowering of pressure occurred during rest and natural sleep.

7 renal hypertension dogs. The neurogenic hypertension had been developed three to eleven months before the experiment. The renal hypertension was produced by placing tight silk or linen capsules about both kidneys from one to eleven months before the experiment. Blood pressures were taken by arterial puncture during this period to familiarize each animal with the procedure. The last blood pressure was taken in a dark quiet room just before the experiment. Pentothal sodium in a 2.5 per cent solution was then introduced through the saphenous vein until the anesthesia was sufficient to prevent pain reflexes. A second arterial puncture was performed four to ten minutes after the induction to determine the blood pressure under anesthesia. Respiratory arrest and pronounced cyanosis occurred in certain dogs of the neurogenic hypertension group. These experiments were repeated until satisfactory respiration was maintained. The neurogenic hypertension animals required slightly more pentothal sodium for anesthesia than did the control or the renal hypertension groups. The effect of pentothal sodium anesthesia is illustrated in figure 3. The blood pressure rose in 2 of the control dogs and dropped

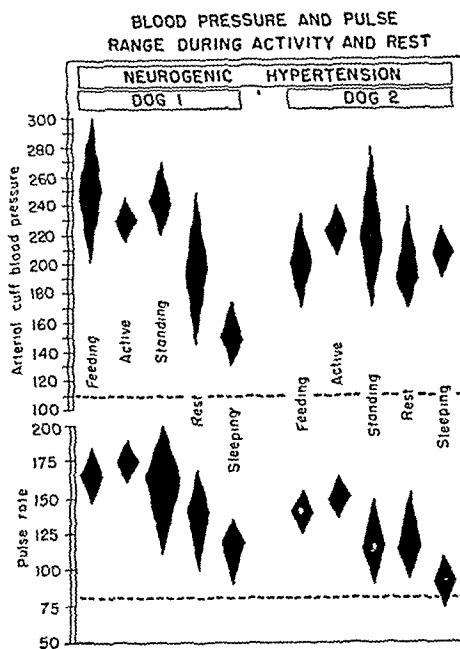


Fig. 2.—Blood pressure and pulse range of 2 of 4 neurogenic hypertension dogs. Dog 1 demonstrates the greatest lowering observed during natural sleep and dog 2 the least. The blood pressures of the neurogenic hypertension dogs during sleep did not reach the low values observed in the normal dogs (fig. 1).

CHLORALOSE AND ETHER ANESTHESIA

The effect of chloralose anesthesia on blood pressure was observed in 4 normal and 5 neurogenic hypertension dogs (fig. 4). The blood pressures were determined by arterial puncture before and after the intravenous administration of 0.08 to 0.1 Gm. of chloralose per kilogram of body weight. Some lowering of blood pressure occurred in 2 of the normal dogs and a

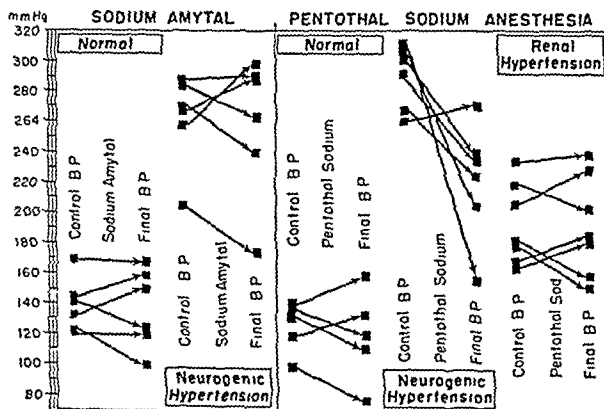


Fig. 3.—The effect of sodium amytal sedation on the blood pressure of 6 normal and 6 neurogenic hypertension dogs is demonstrated on the left. The effect of pentothal sodium anesthesia on 5 normal, 6 neurogenic and 7 renal hypertension dogs is represented on the right.

moderate elevation in 2. A lowering of blood pressure occurred in 1 of the neurogenic hypertension dogs, elevation in 2 and no change in 2.

The effect of ether anesthesia on blood pressure was determined in 4 normal and 4 neurogenic hypertension dogs. Arterial puncture blood pressures were taken

before and after the induction of a deep third plane ether anesthesia. Some lowering of blood pressure occurred in 1 and little change in 3 of the control dogs. The 4 neurogenic hypertension dogs demonstrated a definite lowering. The final blood pressures remained in the hypertensive range.

COMMENT AND CLINICAL STUDY ON REST AND SODIUM AMYTAL AND ANESTHESIA

Repeated blood pressure determinations by an arterial cuff method have demonstrated a range of blood pressures in normal dogs that is higher during activity and lower during rest and natural sleep. The range is greater in neurogenic hypertension dogs. Active blood pressure readings were high. Readings during natural sleep were lower but at no time approached the low level observed during sleep in normal dogs. Sodium amytal did not significantly alter the blood pressures of neurogenic hypertension dogs. Chloralose anesthesia effected little change. Deep anesthesia under pentothal sodium and ether lowered the blood pressures to approximately the same hypertension values as were observed in the neurogenic hypertension dogs during natural sleep. Pentothal sodium did not significantly alter the blood pressure of 7 renal hypertension dogs. These studies would indicate that a neurogenic hypertension produced by a disturbance of blood pressure regulation will persist although at times somewhat reduced through sedation, anesthesia or natural sleep.

Interpretation of these findings into terms of clinical hypertension must be done with reservation. It seems well established that clinical hypertension is effected by an increase of the peripheral resistance. Components of disturbed blood pressure regulation or neurogenic hypertension, pathologic change, particularly arteriolar sclerosis, or renal circulatory change altering metabolism or producing a renal pressor substance may play varying roles in affecting the increase of peripheral resistance. The experiments would suggest that rest, natural sleep, sedation or anesthesia may moderately lower the blood pressure of a neurogenic hypertension. They also suggest that a neurogenic hypertension may

is illustrated by a review of the test as employed on the first 20 patients treated by paravertebral sympathectomy. This procedure, although limited somewhat by anatomic variations and by nerve regeneration, accomplishes sympathetic denervation of most of the peripheral vascular bed throughout the body. Rest and

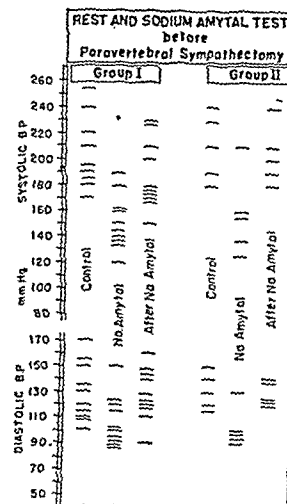


Fig. 5.—The rest and sodium amytal tests of 10 patients who were treated by paravertebral sympathectomy and had a definite lowering of blood pressure are represented in group I. This is contrasted with similar tests of 5 patients who had no lowering of blood pressure in the supine position after sympathectomy, group II.

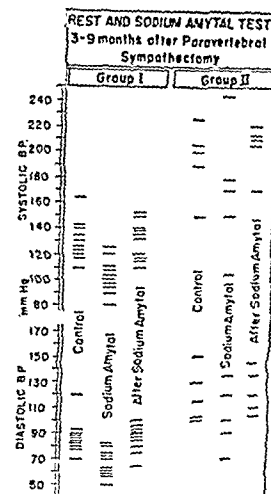


Fig. 6.—The rest and sodium amytal tests of the patients illustrated in figure 5 three to nine months after paravertebral sympathectomy. The 10 patients, group I, with definite reduction of blood pressure could not be differentiated from the 5 patients with no reduction in the supine position, group II, by the preoperative rest and sodium amytal tests (fig. 5).

sodium amytal tests were employed before the sympathectomy and at intervals of three to nine months after the sympathectomy. These were frequently preceded or followed by control twenty-four hour periods of hourly blood pressure determinations that presented a similar curve to that obtained with the sodium amytal.

Rest and sodium amytal tests before operation were separately plotted and then shuffled. Four observers attempted a prediction of which patient would be benefited by sympathectomy and failed. The rest and sodium amytal tests three to nine months after sympathectomy were then examined. Ten patients were selected as showing by the postoperative rest and sodium amytal test an appreciable lowering of the supine blood pressure. Five patients were selected as showing by this test alone no change in the supine blood pressure. Three patients with intermediate results, 1 with a polycythemia vera and another with a Cushing's syndrome were discarded. The preoperative tests of the 10 patients that later showed appreciable lowering of blood pressure are illustrated as group I in figure 5 and compared with the preoperative tests of the 5 patients that later had no lowering of blood pressure, group II. It was impossible to determine by the tests which patients would receive benefit from surgery. Figure 6 represents the rest and sodium amytal tests of the same groups of patients three to nine months after sympathectomy.

The effect of anesthesia was determined from the anesthetist's record of the first operation of these 15 patients. Ethylene or ethylene-ether anesthesia was employed. The blood pressure rose after anesthesia and before operation in 12 patients, remained the same in 2 and decreased slightly in 1. No difference existed between groups.

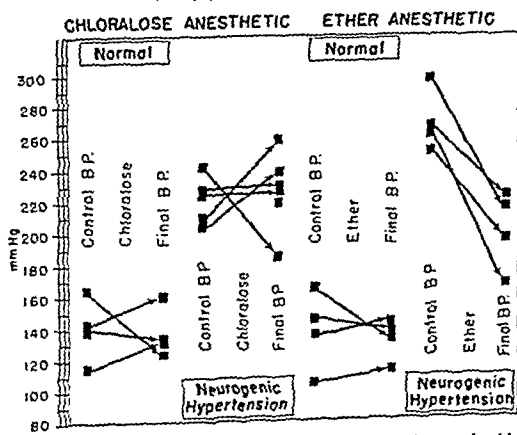


Fig. 4.—Effect of chloralose and of ether anesthesia on the blood pressure of normal and of neurogenic hypertension dogs.

persist under these conditions and that a negative rest and sodium amytal test may not eliminate the possibility that an element of a neurogenic nature may be present.

Rest and sodium amytal tests aid medical evaluation of the hypertensive patient. The importance of the sodium amytal test in the clinical evaluation of a patient should not, however, be overemphasized. This

CONCLUSION

Experimentally and clinically the blood pressure altering effect of rest, sedation or anesthesia has been found variable. Etiologic assumption or surgical prognosis based principally on rest and sodium amytal or anesthesia tests may be misleading. The blood pressure lowering effect of these tests clinically should be but one of many factors considered in the evaluation of the hypertensive patient.

ABSTRACT OF DISCUSSION

DR. GEZA DE TAKATS, Chicago: The significant experimental findings of Grimson and his associates indicate that the neurogenic hypertension in the dog does not respond remarkably to the customary use of barbiturates or sleep, which are so frequently employed in selecting patients for sympathectomy. The neurogenic hypertension of the dog, produced by section of the buffer nerves, may not be identical with the essential hypertension in man. There is good evidence that the buffer nerves are intact in essential hypertension. In my own series the best results with splanchnic nerve section have been obtained in young or middle aged women who have had toxemia of pregnancy or eclampsia, thus an organic vascular disease affecting among others the renal parenchyma. In this group, which consists of an internist, an ophthalmologist and a surgeon, a three day schedule is being used for a preoperative study of the hypertensive patient. As Dr. Grimson stated, the sodium amytal test is not always conclusive. We have had certain cases that indicated through the carbon dioxide pressor test whether the central mechanism is active or not. A patient with a late grade 3 hypertension who showed on biopsy a late benign renal sclerosis gave a slight response to the carbon dioxide pressor test. On the other hand, a younger patient with other tests showing early grade 1 hypertension with considerable vasomotor activity gave an exaggerated response to carbon dioxide. The block of the paravertebral sympathetics as a preoperative test, just like high spinal anesthesia, cannot be a good test for operability, since it is especially apt to cause a definite drop in blood pressure in the older, sclerotic group by causing a sudden failure in venous return. In face of these difficulties the lack of pronounced organic changes and fall in blood pressure to a minimum requirement of 150 systolic, 100 diastolic after rest or sedation still remain the safest criteria for operability.

DR. EMMET B. BAY, Chicago: Dr. Grimson's work in both animals and man has great validity. Any single test is obviously a precarious thing on which to base one's judgment with respect to indications for operation. The sodium amytal test may be largely left out of our armamentarium because some of Dr. Grimson's patients had negative sodium amytal tests and yet had very good response to the operation. It leaves us, however, in great difficulty. The surgical procedure is a major one. We would like to employ it for younger people in whom there was no serious organic change in the precapillary arterioles or in the kidneys. We, as internists, don't like to suggest an operation to patients when we know that so many of these cases have a relatively benign course for so many years. We should like to pick out those in whom the course is going to be a malignant one, pick them out early and attempt to correct this situation before serious irreversible damage has been done. This procedure was, wisely, first used only on elderly patients for the most part who were doomed to die unless something was done about it in a very short time. The fact that as many of them received some improvement as did indicates that it should be included in our thinking about the treatment of hypertension still, but we all hope that those who are working on the physiology of this common disease will find some method of management that will lead to improved care for this large number of patients.

DR. KEITH S. GRIMSON, Durham, N. C.: One impression that Dr. de Takats' report has unintentionally given might be corrected. He demonstrated an outline for a three day pre-operative evaluation of the hypertensive patient. Actually many patients should be evaluated in the hospital for three weeks or more before surgical treatment should be considered.

PSYCHIATRIC SELECTION OF MEN FOR THE ARMED FORCES

RAYMOND W. WAGGONER, M.D.

Psychiatric Consultant, Selective Service System

ANN ARBOR, MICH.

COLONEL WILLIAM C. MENNINGER

MEDICAL CORPS, ARMY OF THE UNITED STATES

AND

COMMANDER FRANCIS J. BRACELAND

MEDICAL CORPS, UNITED STATES NAVAL RESERVE

The importance of the psychiatric aspects in the selection of men for the armed services was recognized by psychiatrists long before the onset of the present war. In 1918 it became so apparent to General Pershing that better methods should be used in screening out those individuals who would be unable to make a satisfactory military adjustment that he cabled to the Chief of Staff in Washington as follows: "Prevalence of mental disorders suggests urgent importance of intensive efforts in eliminating mentally unfit from organization of new draft prior to departure from United States." During the last war attempts were made to screen all recruits at mobilization centers. In some centers most of the recruits were seen by psychiatrists with adequate screening in the light of psychiatric knowledge at that time. In other centers no psychiatric examination was made or it was most unsatisfactory. In a considerable number of instances rejection was recommended by the neuropsychiatric examiner but the recommendation was overruled by the line officer or command surgeon. At the same time the number of neuropsychiatric casualties in the last war was great (41,646) and the postwar problem of care has been stupendous, the total cost of \$30,000 to \$35,000 per man being greater than for any other single group of casualties.

In the summer of 1940 when it was apparent that we were likely to be involved in the present conflict, Dr. Winfred Overholser wrote a detailed and excellent summary of the problem to President Roosevelt, calling attention to the need for the establishment of an adequate psychiatric screening program which could be used when the time came for rapid mobilization of a large army. Considerable thought was given to the subject by psychiatrists and Selective Service planning groups. During the latter part of 1940 and the first of 1941 the Selective Service System established plans and began holding seminars in various parts of the country. This psychiatric program was under the direction of Dr. Harry Stack Sullivan and an advisory committee. The purpose of these seminars was to indoctrinate the local board physicians with the need of and a method of recognition of psychiatric problems and to help them to weed out at the local board level those registrants who would be unable to adjust satisfactorily to the military service. At that time the American Psychiatric Association, through its special committee appointed to deal with wartime problems, was aiding in the development of plans for psychiatric examinations of prospective members of the armed forces.

In several states plans were developed to secure information which would aid in the proper psychiatric selection of recruits. Through cooperation of the

Selective Service System, the Army and the Navy, and with the advice from representatives from the American Psychiatric Association, military psychiatric standards were established. These standards if followed were presumed to cause the rejection of those who would likely fail in military service. The tendency was to reject all persons who showed any evidence of psychiatric disorder. That this attitude has changed is evidenced by War Department Technical Bulletin TB MED 33, which says in part "There is accumulating evidence that many individuals with minor personality deviations and mild neurotic trends can be of service in the armed forces. It is believed that, on the basis of previous directives, many such men are now being rejected at induction stations on neuropsychiatric grounds. The acute need for manpower makes it necessary to admit all individuals to serve in the armed forces who have a reasonable chance of adjusting to such service. The neuropsychiatric study should be made on a longitudinal basis and not on a cross section. The Medical Survey Program was developed by Selective Service to make just such a longitudinal survey possible.

In the present conflict the size of the armed forces is far larger than that of the last war. The forces have been built up to this size in approximately three years. Psychiatric selection, which requires more time than physical selection, has been seriously hampered by this extraordinarily rapid mobilization.

The problem of selection from a psychiatric standpoint is of course to recognize those men who by the nature of their personality makeup will not be able to adjust satisfactorily in the armed forces. It was necessary, with no historical data, to prognosticate the future mental health of these individuals rather than to make the diagnosis of a disease process. Psychiatrists, no matter how well trained, were not prepared for this type of function.

Most of the psychiatrists at induction stations are civilian psychiatrists, and most of those who are in the armed forces have been commissioned out of civil life. These men have an inadequate understanding of the needs of the armed forces, even though they may have a fair idea of the stress to which servicemen may be subjected. As in other fields of endeavor there are both exceptionally well qualified psychiatrists and those who are poorly qualified. By virtue of the amount of work to be done and the shortage of men to do it, all available psychiatrists have been employed. It is perfectly obvious to many of us that some psychiatrists are doing an inadequate and unsatisfactory examination, especially at the induction stations. To quote further from TB MED 33 "Thus, a neuropsychiatric examination consisting of a few leading and suggestive questions such as 'Do you worry?' 'Are you nervous?' or 'Do you have headaches or stomach trouble?' is inadequate, and positive answers to such questions are not in themselves justifiable cause for rejection. Isolated signs, such as nail biting, slight tremor or vasomotor symptoms, are not disqualifying. Normal concern over the prospect of induction, as manifested by moderately moist palms or tenseness, should not be regarded as evidence of an incapacitating disorder. Rejection for neuropsychiatric reasons should be made only in those cases in which the history and examination clearly indicate the existence in the past and/or present of a personality disorder of partially or completely incapacitating degree." These poorly done examinations have in some cases resulted in the rejection

of men who should have been accepted, as well as the acceptance of many who should have been rejected. Much criticism of psychiatric rejections has been expressed by Selective Service board officials, by the Army officials and by the public. Some of this criticism is valid, but most of it is unjustified and has been the result of misunderstanding of the meaning of psychiatric rejection and of the seriousness of psychiatric casualties. In many instances this criticism can be considered a psychologic defense and projection mechanism on the part of the person offering it.

At the present time research is being carried on to develop what might be called a military personality profile. Psychiatric screening has been done on the basis of presumption of psychiatric disorders or indications of the possibility of its development not on the basis of established criteria or exact measurements as is true in the physical study. Therefore the more experienced and capable the psychiatrist making the examination and, within certain limits, the greater the amount of time allotted him, the more accurate will be his prediction as to the inductee's success or failure in the armed forces. It is hoped that, with the greater knowledge of the personality characteristics which lead to failure in the armed forces and of those which spell success, psychiatric selection will become progressively more accurate.

At the present time our job is not only to recognize the manifest cases of psychiatric disorder and those who are apt to develop a psychiatric disorder as a result of the stress of military life but also to select those individuals who will be unable to adapt themselves satisfactorily to military life. This includes the mentally deficient, the inept and the psychotic, as well as those with neurotic characteristics. It should be emphasized that persons with certain types of mild neurosis may do well in the armed forces. Service may resolve the basic conflict. Recognition of the psychopathic personality group is important because, although these individuals may not actually develop a serious psychiatric illness in the armed services, yet by virtue of their inability to adjust they may serve as a focus of infection of bad morale, which in turn may result in breaks in discipline and lead to disaster. This is typified in the description of a situation told by an Army officer who at one time had been placed in charge of a unit with a reputation for bad discipline, which under two or three previous commanding officers had become progressively worse. This man, instead of initiating his command by establishing rigid discipline, carefully observed the unit for a week and then picked out three men who, although they did not have any psychiatric deviations obvious to a lay person, did have psychopathic personalities. These men were discharged, and the unit almost over night changed from one with a very bad reputation to one with high morale.

Those individuals who present psychiatric problems in the service might be considered in four categories or groups. The first group would include those who are manifestly unfit for service and whose disability is obvious or becomes so during the course of a brief psychiatric examination. Such individuals are easily detected and account for a fairly large percentage of the neuropsychiatric rejections at induction stations. The second group are those who are questionably fit but with whom a more complete historical background, the need of observation or both is necessary in order to evaluate their fitness accurately. The historical

information obtained through the Medical Survey Program is particularly important in the selection of this group. In the naval service until the present, these cases have been detected at the naval training station or boot camps, where, after a period of observation and trial duty, the lack of fitness is demonstrated. The third group includes those who are potentially unfit but who may be able to adjust reasonably well for an indefinite but relatively short period of time. These men adjust well until the degree of stress becomes sufficiently severe to produce symptoms. They are separated from the service only after hospitalization study and medical survey. In the future large numbers of these should be detected by the historical information made available by the Medical Survey Program. The adjustment of these individuals usually becomes strained after the first six months. The peak period of discharge of these individuals occurs within the first twelve months of service. Finally, the fourth group would include those who, according to the best possible tests and the highest standards of psychiatric fitness, including an adequate historical background, appear to be normal, well integrated individuals. Not until such persons are confronted with the greater than normal stress of actual combat or prolonged operational duties do they manifest evidence of functional disability. It does not seem likely that any procedure can be set up which will accurately determine which individuals going through induction stations would break down provided they are in this fourth group.

At the present time the procedure for the selection is divided into two parts, the first phase being before the prospective service man reaches the induction station. Following registration, and if the registrant reports any difficulty which makes it apparent to the board that he might not be able to pass the induction station examination, he may be referred to a physician for examination either at the board's request or at his own request, or he may be referred to an advisory board for special examination. At the time of registration or, if registered, when he is considered for the reclassification which will lead to his induction, a survey is made of his previous social, medical and school history. This material is prepared by various regularly constituted individuals at the local board level on special forms for transmittal to the induction station. This survey, which is called the Medical Survey Program, was developed by the Selective Service System in conjunction with the Surgeon General's Office of the Army and Navy. Important procedures in the program are carried out by the use of certain forms.

Form 210 is designed to establish the identity of the individual in reference to treatment for mental illness. If this treatment has been in a state hospital, the registrant is disqualified at the local board level.

Form 212 carries medical and social history so arranged that the examiner at the induction station can determine at a glance the presence of positive or negative information of value. In case important information is available and is so noted by the checking of one of the questions, it is inscribed on the reverse of the form. This form is completed by a special field worker known as the medical field agent.

Form 213 is a composite report from five teachers so arranged that any consistent deviation from the normal will be called to the attention of the examiner by merely glancing at the composite form. This form is to be used for boys from 15 to 18 years of age at the time they

leave school for any reason other than transfer to another school.

Form 214 is to be used to obtain information about school adjustment when it is necessary to get this information from school records.

Only form 210 is to be used as the basis for rejection, and this should be carried out at the local board level. The other forms have information for the induction station psychiatrist and should give him important leads as to possible reasons for rejection or induction. Such procedures have been in use in several parts of the country over a period of many months. The program was established as a national program in October 1943. It is so designed as to give the examining physicians at the induction station the maximum amount of information about each registrant with the minimum amount of time necessary to utilize this information. As first constituted the Medical Survey Program was very comprehensive in its coverage of various factors relating to the adjustment of the individual. As is so frequently true in the development of any plan of this scope, some changes were necessary to suit particular problems in various parts of the country in order to yield a maximum of utilization with a minimum of difficulty. As the machinery of the plan has been developed, various changes have been made and will continue to be made in order to reach the highest degree of efficiency possible. Universal coverage of men forwarded has not yet been achieved but is constantly on the increase. It should be the responsibility of every psychiatrist, military or civil, to assist in this program in order that the aim of best possible selection may be achieved as soon as possible.

The second phase might be considered that which occurs at the induction station and during the early period of the registrant's military career. The induction station psychiatric examination is difficult. A number of factors tend to militate against a completely successful psychiatric study. First and foremost among these factors is the time element. While a reasonably good judgment can be based on a study of ten to fifteen minutes, in many instances so many have had to be examined that the time allotted to each may be reduced to one or two minutes per individual. Without other information, such an examination can be only of very superficial value. Second, not all examiners are of equal competence. Asking such questions of the selectee as "Do you worry?" or "Do you have stomach trouble?" and observing certain minor signs as mild vasomotor instability, mild tenseness results in an almost worse than useless psychiatric examination, and yet frequently this kind of an examination is the basis on which a man is rejected or accepted. It should be apparent that a justifiable rejection can be based only on a longitudinal study of the individual. It most certainly should not be based on an all too brief cross section examination of the individual at the moment of his induction station examination. To quote further from TB MED 33, "Information and time are oftentimes inadequate to establish accurate diagnoses. In many instances the symptomatology and/or behavior may make disqualification of the registrant necessary, although not sufficiently well crystallized to warrant the diagnosis of a clinical disease entity. To label a registrant with a diagnostic term in so brief an examination, without adequate data available, is unscientific, and unfair to the individual. Each clinical diagnosis as given in MR 1-9 will be based on adequate historical and examination evidence. In those instances where insufficient

data are available to arrive at a diagnosis and where it is the neuropsychiatrist's opinion that the registrant is not acceptable, he will indicate that the individual is disqualified as 'not suited for military service.'"

In some sections of the country the induction stations are using an autobiographic social survey. This consists of a questionnaire which is given each registrant at the induction station and which he is to complete by the time he reaches the psychiatrist. Since the psychiatrist is usually last or next to last in the examining line, the registrant has ample opportunity for filling out the form during the course of his other examinations. This form has proved of considerable value in selection, but difficulties arise in connection with its use. In certain instances the individual refuses to put down all the information required or records inaccurate information, which at times may be misleading. This form cannot be used by illiterates. Some of the registrants tend to consider the psychiatric examination as a joke or to be very much frightened by it. Those reactions are in themselves a valuable index of the registrant's personality makeup. This plan, where used, supplements the information obtained by the Medical Survey Program.

There are important social implications involved in the examination of men for the armed forces. To many men who failed to be selected for service, this failure represents a threat to their self esteem and self confidence. This is particularly true with regard to certain types of psychoneurosis. A significant factor in the readjustment of the individual in his community is the fact that he frequently carried back with him a label which connotes maladjustment, the label being the result of a diagnosis made on the basis of a very brief examination. This diagnosis may make it more difficult for him to adjust to his home situation, for him to meet his associates if they know of his diagnosis, and for him to obtain reemployment or to return to his previous occupation.

There has been an unfortunately wide misinterpretation of the meaning of psychiatric rejection. Too many individuals have assumed that a neuropsychiatric rejection or a neuropsychiatric discharge from the armed forces signifies that the individual involved is "crazy." Even the rejectee involved may assume this to be the case. One person rejected for psychoneurosis looked the term up in the dictionary and found also the term psychosis, confused the terms, and both the patient and his family became extremely anxious for fear that within the near future it would become necessary for him to be committed to a state hospital. Whether this misinterpretation is wilful or the result of lack of understanding of the problem is not nearly so important as is the great harm which is done to those in the rejected group. It should be a part of our responsibility as psychiatrists and neurologists to clarify the issue whenever opportunity arises. Such clarification requires the development of better community understanding of psychiatric situations in general and of the psychiatric problem of the service man in particular. Education of the community concerning the role of psychiatry in war and in peace is urgently needed. In some respects psychiatry has been oversold; our need is to face the problems of community understanding squarely.

In a report of the first year's experience of the Information and Counseling Service at the Milwaukee Induction Station made by Miss Dorothy Paull, it is stated that "after a year of experimentation and observation we are more convinced than ever that the public has

no realization of the extent of emotional and mental illness in its midst or of the lack of resources to cope with it. Many young men are carrying on a tragic and lonely struggle attempting to make good against terrific odds of environment and unhealthy mental habits and family pattern." This is a clear and succinct statement of an important problem. With the information being developed under the Medical Survey Program the background for reeducation of the public and for a better understanding of the problem of psychiatric disabilities can be developed. This ought to be particularly useful when demobilization day comes. With the mass of information which will be available and which will remain confidential, those who are qualified to utilize it should be able to make a very real contribution to the better adjustment of our people.

Certain factors have been high lighted by our experiences in the psychiatric selection of men for the armed forces. The most important is perhaps the demonstration of such an alarming amount of mental ill health in our communities. The need for a more comprehensive mental hygiene program is obvious. It is our responsibility to provide and facilitate this program. The material available through the Medical Survey Program and through our experience at induction stations and in the armed forces, if properly analyzed, will serve as sign posts on the road leading to a better understanding of public needs and be put to excellent use by business, industry and the professions.

ABSTRACT OF DISCUSSION

DR. HANS DEUTSCH, Chicago: In these last three and one-half years I have gone through the difficulties which confront the psychiatrist in selecting men for military service. The first apparent difficulty was the lack of indoctrination before induction, and therefore the men manifested a lack of receptivity toward military discipline. Another important factor which might interfere with the obedience of a man joining the armed forces was negativism. From the start I favored the term "unsuitability" and instructing the man as well as the public that it is no reflection on the personality when a man is disqualified. Of prime importance is it to look at the man and his conduct during examination, and then if necessary look at the history. What we need are facilities for disposal of the man; not a rejection or acceptance but to decide where to put the man either in civilian or in military life. In that way we would not have so many men hesitant to join the armed forces or appeal for induction reexamination.

COLONEL LEONARD G. ROWNTREE, M. C., A. U. S.: In the thirteen million records to date we have had more than four million rejections. In addition to this we have many hundred thousand discharges. We apparently have a problem facing us in the nation of lack of physical and mental fitness that has never been suspected. Selective Service has attempted to deal with this problem in many different ways. We have been very fortunate in securing as adviser in this program Dr. Raymond W. Waggoner. We have provided for changes in this program when the need becomes apparent. We have requested the National Research Council to set up a committee consisting of Dr. Overholser, Colonel Menninger, in charge of the Psychiatric Service of the United States Army, and Commander Braceland of the United States Navy. They have studied this program to date. They are permitted to recommend changes, if changes become desirable. We have developed what we consider to be the best possible system for the gathering of information of medical, social and educational histories on each registrant and have presented it in its present form for the aid of the psychiatrist at the induction stations. The Medical Survey Program has been set up in response to a request from the Secretary of War to General Hershey, saying that a system of assistance must be developed in this field. I would request that all who have to do with examinations utilize the material col-

lected to the utmost. The problem has been in effect only six months. Most of our difficulties have been surmounted. The program has advanced far beyond what I believed was possible for any program of this magnitude in the short time it has been in existence. If you have suggestions for change, make them to the committee referred to or to Dr. Waggoner. All suggestions will be given serious consideration. In the meantime, I believe that if you will use this plan you will find that it fills a real need. The system should become more valuable as time passes.

DR. RAYMOND W. WAGGONER, Ann Arbor, Mich.: There have been many difficulties with those who were charged with the execution of the program and quite as many difficulties among those charged with its use. Perhaps this is the most serious problem. Many of us may feel that it is evidence of our inability to do a good job to have to rely on assistance such as that furnished by the Medical Survey Program. No one can deny that a good medical-social history is of great importance in making a prognostication concerning the future mental health of the individual. A question has just been handed in asking whether there are any data as to how we compare as a nation with respect to the occurrence of neuropsychiatric casualties with other nations, particularly Germany and Italy. I am not in possession of information necessary to answer the question.

PSYCHOSOMATIC RELATIONSHIP TO GASTROINTESTINAL DISEASES

MARTIN G. VORHAUS, M.D.

AND

S. ZACHARY ORGEL, M.D.

NEW YORK

The early twentieth century witnessed the ascendancy of the therapeutic nihilism of Osler. It had been preceded and influenced by a structural concept of disease derived from the precise pathologic investigations of Virchow. These autopsy studies had stressed abnormal cellular findings and centered the activity of medical students in the morgue.

The rebellion from the concept that disease is a fixed pathologic state was led by the modern psychologists. Their investigations of the psyche emphasized the role of the personality in the expression of disease. It is largely the result of these studies that has terminated the independent development of internal medicine and clinical psychiatry. No longer should a patient be treated only in terms of his specific complaints. A careful survey is made of the sick man from the standpoint of his personality as well as his organic disturbances. This new approach, which has as its basis the recognition and acceptance of the interdependence of the psyche and the soma, is known as psychosomatics.

The gastrointestinal tract is the primary battleground for the conflicts between the psyche and the soma. Here is the site for many primitive gratifications and abuses, adjustments and accommodations. These concepts have long been recognized but are only now being translated into a dynamic plan of treatment. Until now the results in the treatment of the functional disorders of the gastrointestinal tract have been largely unsatisfactory. Since these so-called functional cases represent more than a majority of all those seen in a gastrointestinal clinic or in private practice, the large percentage of failures in this group is a challenge. To meet this challenge the gastroenterologist must approach the psychotherapeutic problem with the same precise skill that he employs in establishing a physical diagnosis.

Read before the Section on Gastroenterology and Proctology at the Ninth-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

Our purpose in this paper is to correlate and emphasize clinical experience dealing with:

1. The recognition of the origins and mechanisms of some gastrointestinal symptoms.
2. The exposition of basic principles of psychosomatic therapy.

In our studies we have arbitrarily divided our patients into two categories. The first group consists of those in whom no organic gastrointestinal disease can be demonstrated. Various clinics¹ have estimated that this so-called functional group represents from 50 to 75 per cent of all patients. The second group consists of those patients with true organic disease in whom concomitant psychologic disturbances complicate, mask or interfere with the treatment of their organic disease. No accurate estimate has been made of the percentage this group represents.

Irrespective of the type of case, it becomes essential to investigate not only the physical components but the psychosomatic factors as well. The first step in this direction, which is best taken after the diagnosis of physical disease has been established or proved absent, is the taking of the psychosomatic history.

PSYCHOSOMATIC HISTORY AND DIAGNOSIS

The fundamental cause of psychosomatic illness is the emotional immaturity of the adult. It is this lack of emotional stability that occasions the conflict between the intellect and the emotions, which in turn creates the disharmony conducive to ill health. By treating the individual and not his gastrointestinal tract, the physician will attempt the reeducation of the emotions which is the psychotherapeutic goal.

Felix Deutsch² and others have stressed the skilful guiding of the patient's discussion of himself as a medical case and as a human being. The physician must give the patient sufficient time to tell his story in his own way. Two important objectives are thus gained: first, the cathartic value to the patient by the recitation of his difficulties and, second, the establishment of the patient's confidence through the demonstration of sincere interest by the physician. The ideal method seems to be one of casual conversation, utilizing free association and careful questioning. Only as the physician gains the patient's confidence can he learn of the past struggles and the conscious present anxieties of the patient's life situation in regard to family, friends and business.

Dunbar³ suggests that the following important diagnostic points be obtained from the history: 1. "A picture of the patient's life in which his major environmental stresses are outlined, together with his psychological and physiological reaction to them." 2. A picture of the patient's characteristic reaction pattern in terms of the environment and emotional situation to which he has adjusted with ease or difficulty, again in relation to illness history. 3. The topics he tends to avoid and misrepresent, and the topics that are accompanied by an increase or decrease in his skeletal or vegetative response and by temporary increase or relief of his symptoms. Type of defense used by the patient—whether he will try to keep his anxieties to himself or seek relief in action, as for example fidgeting or walking

1. Eusterman, G. B.: Diagnostic Aspects of Roentgenologically Negative Gastric Disorders, *J. A. M. A.* **107**: 1432 (Oct. 31) 1936. McLester, J. S.: Psychic and Emotional Factors in Their Relation to Disorders of the Digestive Tract, *ibid.* **89**: 1019 (Sept. 24) 1927. Menninger, W. C.: *Am. J. Digest. Dis. & Nutrition* **4**: 447, 1937. Robinson, G. C., and Paulson, M.: *Rev. Gastroenterol.* **6**: 454, 1939. Sullivan, A. J.: *Am. J. Digest. Dis.* **6**: 454, 1939. Weiss, E., and English, O. S.: *Psychosomatic* **18**: 354, 1939. W. B. Saunders Company, 1943.
2. Deutsch, F.: *Diagnosis*, New York, Paul B. Hoeber, Inc., 1935.
3. Dunbar, J. C.

up and down the room, or seek relief in smoking or talking about his symptoms. Attention should be paid to hesitancy, crying, laughing, evasion, tenseness and an increase or decrease of symptoms. 4. Dreams and other indications of the unconscious, especially divergences between dream material and the patient's statements may be of value. This presumes adequate special training on the part of the physician in the interpretation of this material.

The review of the psychosomatic history should enable the physician to make a diagnosis of the personality disorder. The psychopathologic basis of the specific personality disorder then becomes clear and permits an exact diagnostic term. This will be one of the accepted classifications of psychoneuroses or psychoses or some combination of them.

PSYCHOSOMATIC THERAPY

In the first group of cases in which the diagnosis "no organic disease" has already been made, psychosomatic therapy should be instituted early. It should be reemphasized that all steps should have been completed to eliminate the possibility of physical disease before psychotherapy is begun. Group 1 has been subdivided into (a) mild, (b) moderate and (c) severe. In group 1a (mild), if the symptoms are of short duration, simple reassurance may suffice to effect a cure. Often, if the intelligence of the patient permits, superficial insight is extremely helpful.

CASE 1.—A married woman aged 35 with abdominal discomfort and low abdominal pain of three months' duration was asked to face the fact that there was no organic disease present. Investigation into the personal history disclosed a sense of guilt due to an extramarital relationship. The resulting tensions created a psychogenic stimulus for her gastrointestinal symptoms. Her recognition of her anxiety as a causative factor of her complaints was followed by disappearance of her symptoms. The essential fact to be recognized in these cases of mild anxiety is the value of mental catharsis. Often simple encouragement to the patient to talk out his present day problems is followed by relief of his tensions.

In cases of moderate severity and longer duration, group 1b (moderate), reassurance alone is often insufficient. In this group it is necessary to plan and carry out a program of education for the patient. The first step is to awaken a recognition that the gastrointestinal symptoms are simply a geographic transfer of emotional tensions. The object of this educational program is to assist the patient in "calling things by their right names." The sooner the patient is able to recognize that the origin of his discomfort is psychologic the quicker will his insight develop. In this process of education the clinician should keep in mind the experience of the psychiatrist who has demonstrated that often the patient will not readily accept from the physician any explanation of psychologic mechanisms. On the other hand, those conclusions laboriously and circuitously arrived at by the patient himself have greater validity and are productive of more insight. In effect, the psychotherapeutic approach stimulates the patient to discover his own transference of tensions. The physician then repeats the patient's words, approving and agreeing with his discovery. The statement by the patient is no assurance that the thought expressed has reached the conscious level. The repetition of the same words by the physician now becomes a conscious thought, since it reaches through the auditory mechanism into the conscious awareness of the patient, coming to him from a parent ideal or substitute. This approval

is accepted with gratitude, or, as the psychiatrist says, "The patient feels that he is getting love." The usual result of this situation is a further stimulation of the patient to reveal more of his hidden tensions and thus gain further insight. This learning process is often slow and halting, especially when resistance of the patient is pronounced. In such instances the use of repetition of essential points is of considerable value. The capacity to learn varies with patients. Some learn quickly, others slowly, and many tend to suppress all or part of what they have recently learned.

CASE 2.—The case of a man aged 25 with a history of low abdominal pain and bouts of diarrhea of eight years' duration serves to illustrate these points. A diagnosis of colitis had been corroborated by several physicians and accepted by his draft board as sufficiently valid to classify him as 4-F. After a physical examination, sigmoidoscopic studies and gastrointestinal x-ray examinations had failed to reveal any organic disease, investigation of his personality disclosed a clearcut feeling of inferiority. For many years a constant fear of failure arose from any type of competition in school or in his job and from his social contacts with his contemporaries, both male and female. The diagnosis was revised to one of irritable colon with psychosomatic factors. In succeeding sessions he was encouraged by free association to describe those events associated with the onset of individual attacks. After reliving several of these experiences, the importance of his fear in the production of an attack became apparent to him. It was not long thereafter that he asked the question "Does fear bring on these attacks?" This stimulated further discussions concerning the origin of his fears and the psychologic meaning of diarrhea. Clinical improvement became apparent with the comprehension of his fears and their effects. This patient has been under observation for two years. In the two mild recurrences of diarrhea that have brought him back for observation he was able to state without prodding the entire sequence of events from dread of failure to diarrhea.

In the 1c (severe) group we have placed those patients whose symptoms are sufficiently serious to produce considerable interference with the normal routine of life. Many of these patients are unable to carry on adequately in their jobs. Frequently the complaints have existed for more than half the life span of the patients. Because of the long duration of symptoms considerable difficulty is encountered in obtaining an accurate psychosomatic history. Greater skill is required in eliciting the personality problems, many of which extend thirty or more years back into childhood. This longer period of time has created greater facility for complicated displacements of emotional tensions; the trail from these to the geographic transfer in the gastrointestinal tract is often vague. The patient's resistance to the psychosomatic approach should be anticipated by the clinician. Few if any ideas are willingly accepted and are rarely self learned. The inability to accept the significance of symbolism predominates. The experienced practitioner of psychosomatic therapy soon learns the expected limitations of treatment with this group of patients. To him they are the equivalent of the chronic cardiac, chronic bronchiectatic and the chronic nephritic so often encountered in internal medicine. Since resistance to therapy is strong and the pattern of tension complicated, the gastroenterologist must screen this group with a view to separating those patients sufficiently young and malleable for psychoanalytic therapy. For the remainder, into which group most of the older age patients fall, the only plan is "to carry on." In this technic of "carrying on," constant reassurance is the main "crutch" offered to the patient. It should never be

the only means of support. Even here the physician should encourage the patient at each session to discuss concerns other than the gastrointestinal complaints. Repeated efforts should be made to direct these energies and tensions into some creative or otherwise productive field of endeavor. In this connection the stimulation of avocations and the development of hobbies as a form of occupational therapy is of inestimable benefit. Their value is to direct the patient's thoughts of his own and his family's concerns into other channels. By this projection the patient derives not only relief from his own tensions but satisfaction in his new hobbies.

CASE 3.—A woman aged 61, with over forty years of belching, will serve to demonstrate some of these mechanisms. Since adolescence, repeated and often audible eructations of gas had driven her from doctor to doctor. In the last twenty years the additional story of a substernal lump soon after swallowing and the existence of transient cardiospasm required repeated medical investigation. The usual studies, a survey which required much less time and effort than the attempts at taking a psychosomatic history, excluded any organic disease. She was first of all persuaded to give up all medications previously prescribed. After repeated attempts, her interest in her symptoms was diverted and directed into her personal problems. Believing that some clue to the beginnings of her illness might become apparent, she was encouraged to talk of her childhood. In one of these sessions she mentioned a long cherished hope of learning to paint. The assurance that she was neither too old nor too ill to take up this hobby was grasped as the first constructive concept in many years. For the past ten years all of her free time has been spent in this pursuit. It is now six years since the last attack of cardiospasm, and her aerophagia reappeared only at the eve of her "one man show," given this season at the age of 70.

Typical case histories as the three quoted tend to oversimplify the problems of psychosomatic therapy. This faulty perspective has been created by the deliberate selection of cases, as each one of them was chosen to illustrate different phases of this group. Whenever the physician is dealing with patients whose symptoms arise solely from psychosomatic factors, the absence of organic disease is a potent ally. At moments of despair, at the end of a blind alley, the encouragement to be derived from the constant reiteration that "You have no organic disease" often enables the patients to take their first step forward on the path to health.

In the treatment of group 2, those with organic disease plus psychosomatic factors, a totally different situation exists. The patient must face and the physician must freely admit the existence of physical disease. To this burden is added the need for recognition and acceptance of a complicating psychologic disturbance. Since it is only rarely that the two states can be concurrently treated, and since priority must be granted to the therapy of the organic disease, this state of affairs is a deterrent to the onset of psychosomatic therapy. Much time and effort is spent with this group of patients, outlining the steps to be taken for improvement and possible cure. In many instances detailed explanations are required as to which symptoms arise from organic disease and which from emotional stresses. Often these have an intricate interrelationship, and for most of these patients an early acceptance of the role of the psyche and the soma is impossible.

CASE 4.—An illustrative case in the 2a (mild) group is that of a man aged 39 complaining of attacks of dull epigastric discomfort, belching and nausea for over ten years. The patient had observed these attacks carefully and knew that certain foods and emotional strain were competent producing causes of these attacks. The physical factor was a dilated, poorly

functioning gallbladder without demonstrable stones. The emotional factors centered about a closely knit excitable family in which the patient and his youngish stepmother were the hub of neurotic stress. In the plan of treatment it required but little time for the patient to recognize his difficulties with his stepmother, but he had very little insight into the incestuous nature of his drive. His economic level precluded psychoanalytic treatment. In the course of time he gradually permitted himself to seek companionship out of the home. This loosening of the familial ties was followed by increasing interest in female companionship, which culminated in a happy marriage and his attacks abated. Family reunions, especially at holiday times, are usually followed by a mild recurrence of symptoms, but these are of short duration. In the last six years he has been free from anxiety in regard to his health and relates frankly and with some amusement of the family friction that precipitates each attack.

The cases of moderate severity (2b) present greater difficulties in treatment, and yet even here the results need not be too discouraging.

CASE 5.—A case in point is that of a 19 year old youth discharged from the Navy after eight months of service with a diagnosis of duodenal ulcer as his medical disability. For five years symptoms had been present, and the diagnosis had been established and confirmed. The personal history disclosed the fact that the year before the onset of his symptoms his father had died, following an operation for duodenal ulcer. The patient, an only child, left school and assisted his mother in a small retail business, which was the sole source of income for the family. The conflicts between mother and son occurred daily, both at work and in the home. Since the educational and economic level of the patient placed psychoanalytic therapy beyond his reach, the more superficial psychotherapeutic approach was attempted. As the duodenal ulcer responded to treatment, the patient discovered that his Sundays, if spent outdoors, were his most comfortable times; he was encouraged to take more physical activity. After his symptoms abated and the x-ray follow-up substantiated this improvement, he was urged to translate his love of the outdoors, and separation from his mother, into a plan for future vocation. With the aid of a scholarship he is now learning agriculture at a farm school, and his freedom from symptoms and gain of 15 pounds (6.8 Kg.) in weight provide a real promise for the future and permit a temporary classification of a successful therapeutic response.

In the last category, 2c (severe), fall the most difficult problems. Most of these patients are past 40, and their enjoyment of life has been impaired by their illnesses for many years. The physical disease is usually incurable, and the groove of psychogenic tension is often ineradicable.

CASE 6.—The case of a woman aged 64 with rheumatic heart disease, mitral and aortic insufficiency and a complicating hiatus hernia will serve to demonstrate this group. When first seen she was in mild congestive failure, which responded to the usual treatment. Her heart disease had been known to her for many years, and she had made a good adjustment to it. X-ray studies revealed a hiatus hernia, which explained her more recent attacks of high epigastric pain and its associated symptoms. To accept this additional physical disease was more than she was willing to bear, and her first reaction was to deny its existence. After corroboration of the diagnosis at other clinics, she reluctantly and even resentfully accepted the need for treatment. It was at this point that a satisfactory psychosomatic history was first obtained. Investigation of her emotional tensions revealed an involved interlinking of her gastric symptoms with her wish for self punishment and her death drive. As was to be anticipated, little headway was made in the early weeks of treatment. Slowly she began to realize that these repeated aggressive attacks had not resulted in the death that she anticipated. Gradually it became apparent that these episodes occurred only in the presence of loved ones or in public places and produced painful embarrassment. In

effect the gastric symptoms symbolized her willingness to give and her unconscious desire to receive the love and help of her dear ones. It was possible at this time to institute sufficient psychosomatic therapy to disassociate her anxieties from her gastric symptoms. She gradually attained sufficient superficial insight to provide her with the courage to meet her emotional problems without creating the mechanism of geographic transfer. In the past four years her complaints have been less frequent and less intense. The symptoms of her hiatus hernia continue, but they are no longer initiated or aggravated by her emotional tensions.

In the presentation of this clinical study it is a relatively simple task to divide arbitrarily all cases into the two groups mentioned—i. e. functional and organic. In actual practice there is in addition a small number of patients who appear to fit into an intermediary group. These patients at first manifest symptoms which arise only from functional disturbances, but after a lapse of time there develops real organic disease. This type of case is not only seen in a gastrointestinal clinic. Many internists believe that toxic diffuse goiter and essential hypertension may well fit into this group, which many of us classify as the "dynamic diseases." Schematically it can be represented as psychologic disturbance, alteration in secretory and/or motor activity, diminished cellular vitality, organic disease. In this group may be included cases with mucosal ulcerations in the esophagus, stomach, duodenum and colon. Also patients with disturbances of sphincteric control (namely, cardiospasm, pylorospasm, sphincter of Oddi spasm, anal sphincter spasm or relaxation) may well fit into this transitional group. To what extent a functional disturbance in the mechanism of the sphincter of Oddi can eventuate in organic disease of the gallbladder and/or the pancreas may at the moment be left for future speculation.

UNITY OF THE PSYCHE AND THE SOMA

The ancient belief that sickness is a visitation from the Lord, a punishment for evil, still persists in the mind of man. Although scientific advances have stamped this as superstition, we know that every man creates and obeys his own god or gods and that every man decrees and executes judgments of punishment on himself. For some it is necessary to have a daily stint of punishment and pain; at times an external cross is replaced with an internal one, such as an organic disease. Observations such as these have encouraged modern medicine to investigate the influence of psychic factors on physiologic functions. The physician of the prescientific period was concerned with the entire life situation of his patient. The exact laboratory methods of the latter part of the nineteenth century reduced the psychic theory of disease to superstition, but recently the importance of the psychic status of the patient is again receiving attention. This interest has been stimulated by the work of Freud and Breuer and their students, who clarified many personality disorders and elaborated the libido theme and ego and character analysis. This resulted in an understanding of the role of the emotional factors in illness complicated by or eventuating in actual organic damage. Interest then gradually veered to a study of symptoms produced by disturbances in the autonomic nervous system and led to what Freud termed the "future of medicine." This was the investigation of the psychogenesis of those organic disorders theretofore segregated from psychiatric interest because of their supposed organic causation.

Alkan⁴ stated in 1930 that organic disease may be profitably studied by psychologic methods. He indicated that psychogenic disturbances within the field of the autonomic nervous system may result finally in organic changes whose morphologic mechanisms form only the last link of an intricate causal chain. He postulated that intrapsychic conflicts may be expressed by spasms of smooth muscle which secondarily lead to anemia of an organ, vascular stasis, dyskinesia, atrophy or infection. The result may be organic changes in visceral tissues or somatic structures, which of themselves, as terminal events, are irreversible and constitute the so-called organic disease.

Alexander and his group through their psychoanalytic researches have become convinced of the psychogenesis of gastrointestinal disorders. They believe that organic changes are the last link in a complicated functional chain of events of which the basic etiologic factors are psychologic conflicts. Alexander states that no disturbance of innervation of an organ could symbolically express a specific fantasy or a repressed idea. An organ's specific function, he believes, could be used to express a tendency of psychic direction which by a process of conflict could not normally be expressed through the voluntary nervous system and its organs of expression. To quote Alexander:

Physiologically the process of life can well be described in terms of the three major functions of *in-taking* of substances and energy from the environment, partially *retaining* it during the process of growth and *elimination*—elimination of the end-products of metabolism, elimination of substance for the purpose of propagation and the constant production of thermic and mechanical energy. It would not be surprising at all if it should turn out that the elementary psychologic tendencies of the individual correspond to these three biologic phases of life and that psychologic dynamics . . . correspond to the biologic dynamics of life.

Alexander⁵ and his group at the Chicago Institute of Psychoanalysis are impressed with the constancy and similarity between the nature of the psychologic conflict and the type of gastrointestinal disorder. They find it possible to describe the patient's emotional trends in terms of the three elemental tendencies applicable to both the psychologic conflict and the gastrointestinal symptoms. First, the wish to receive or take as related to gastric disorders; second, the wish to give or eliminate as applied to the diarrhea cases, and, third, the wish to retain as applied to the constipation cases.

Psychoanalytic theory explains why the functions of nutrition are especially adapted to express the repressed or externally thwarted receptive tendencies which we find predominantly in gastrointestinal disorders. In the psychologic development of the infant, his first interest and aim in life is concerned with the intake of nourishment. "The infantile wish to receive, to be taken care of, to be loved, to depend upon some one else, is most ideally gratified in the parasitic situation of the suckling infant. Thus these emotional qualities of receptivity become closely associated in an early period of life with the physiologic functions of nutrition."⁵ Being fed becomes the equivalent of being loved. The character attributes of the adult individuals with gastric disorders were often found to be ambition and aggressiveness. They consistently strove to be independent, active and efficient, and frequently had

4. Alkan, L.: *Anatomische Organkrankheiten aus seelischer Ursache*. Stuttgart, Hippokrates Verlag, 1930.
5. Alexander, F.: *Psychoanalyst Quart* 2: 501, 1934.

achieved considerable success. The unconscious desires of these individuals, however, showed that this desire for independence, ambition and self assertiveness was an overcompensation. They were leaning over backward to repress or deny completely their unconscious wish to be dependent, to be loved, to be fed. It was thus apparent that in these gastric neuroses the unconscious desire in the primitive mind was directly associated with the child's first manifestation of love, namely food and nourishment. It is presumed that the gastric symptoms are caused through these unconscious tendencies which serve as chronic psychic stimuli to the stomach, independent of the process of nutrition. The stomach behaves as if it were taking or about to take food. The greater the rejection of every receptive gratification in life, the greater will be his unconscious wish for receiving love and help. Food is craved not because of organic hunger but as a symbol of love and help. The stomach under this permanent chronic stimulation constantly behaves as if it were about to receive food, or as during digestion. The epigastric distress, heartburn, belching and other symptoms of the nervous stomach are probably due to this chronic stimulation and provide one theory for the development of ulcer.

Many patients with irritable colons were found to solve the same conflict in a different yet typical manner. "The dynamic formula for these cases is as follows: 'I have the right to take and demand, for I always give sufficiently. I do not need to feel inferior or guilty for my desire to receive and take, because I am giving something in exchange for it.' The assumption is that the diarrhea apart from expressing aggression serves as a substitute for giving of real value."⁵ In this conscious attitude there is again apparent the parallelism between the nature of the disorder, namely diarrhea, and the person's attitude toward life, particularly as it is reflected in his relations with other people.

It is easy to understand why the lower end of the intestinal tract is especially suited to express activity, aggression and the wish to give. Here, as in the gastric cases, it is assumed that the peristaltic function of the intestine under the permanent psychic stimulus of the wish to eject and to give becomes independent of the normal physiologic regulations. This explanation stems from psychoanalytic findings which link the early coprophilic attitude of the child with the unconscious symbolic significance of the intestinal contents as a valuable possession. The use of defecation as a sadistic or an aggressive tendency develops after the child learns to assume a deprecatory negative attitude toward his excremental function.

In the analytic study of some patients suffering from constipation, the individual's emotional attitude toward his environment can be expressed in terms that apply equally well to his psychologic problem—namely, to retain or to hold on. The conscious attitude in these individuals demonstrates an unwillingness to receive help from others or to depend on them. At the same time there exists an extreme sense of obligation to give, of which the patient tries to rid himself by renouncing all conscious tendencies to receive. The conscious attitude is summarized as "I do not take or receive; therefore I do not need to give." Added to the positive evaluation of the intestinal content as a valuable possession is found an anal-sadistic attitude, the inhibition of which contributes to constipation.

The findings of the psychiatrists in these three groups are significant, but the dynamic tensions of all patients cannot be reduced to these three types of gastrointestinal disorders. In many individuals there exists a specificity of unconscious demands, and the gastrointestinal tract is often affected by these chronic psychogenic stimuli. Psychoanalytic treatment offers the possibility of adequate knowledge of these factors—not only to the psychiatrist but to the patient. When psychoanalysis cannot be instituted, a study of the life situation of the patient and insight into his repressed tendencies and unconscious desires will reward the internist trained in psychosomatics with a clear understanding of the therapeutic problem.

SUMMARY

The psychosomatic approach has a special value in the treatment of the functional gastrointestinal patient. The high percentage of therapeutic failures hitherto encountered in this group is largely due to a lack of recognition of the psychobiologic disturbances. To meet this problem satisfactorily the gastroenterologist must be as thoroughly trained in psychosomatics as he has been in internal medical diagnosis and treatment. The acceptance of the unity of the psyche and the soma is an essential of the psychosomatic concept. A primary requisite toward the establishment of an accurate psychosomatic diagnosis is the method of taking the psychosomatic history.

Careful screening of all patients and the selection of those suitable for psychoanalytic therapy is an obligatory function of the internist. For the remainder, the gastroenterologist must render as much psychotherapy as the flexibility and intelligence of the patient permit.

In those cases in which psychologic disturbances are coexistent with organic disease, the utilization of psychotherapy in conjunction with medical therapy is of value.

The modern concept of psychosomatics reemphasizes the need for the treatment of the entire patient, his emotional difficulties as well as his physical disease.

In the future therapy of gastrointestinal diseases the psychosomatic approach will play a distinguished role.

1130 Park Avenue—667 Madison Avenue.

ABSTRACT OF DISCUSSION

DR. FRANZ G. ALEXANDER, Chicago: From the practical point of view, a differentiation between cases with and without organic disease is perhaps permissible. Theoretically the validity of such a sharp distinction is questionable. A more adequate distinction would be to differentiate between disturbances with and without irreversible structural changes. Also the subdivision into mild, moderate and severe cases is, from the practical point of view, permissible. Under the influence of traumatic experiences, mild cases may turn into moderate or severe cases. In the field of psychogenic disorders we must be aware of the extreme fluidity of such conditions. It is a well known observation that severe peptic ulcer symptoms may rapidly disappear when the patient is placed in a sanatorium, and then released from his daily emotional strains. Such an observation alone suffices to demonstrate the futility of any attempt to try to attach a diagnostic tag such as mild, moderate or severe to any case as a permanent description. The more experience one has with psychosomatic disturbances of the gastrointestinal tract, the more one becomes impressed with the

capriciousness both of symptomatology and of therapeutic results. The patient's intrinsic capacity to deal with his emotional problems, on the one hand, and the flexibility of the life situation, on the other, determine the therapeutic chances. A patient whose life situation does not allow changes which would relieve emotional tensions will react more slowly to therapeutic efforts. The capacity of such patients to deal with emotional tensions must be changed, which is always a much more difficult and time consuming therapeutic task than the adaptation of the life situation to the emotional needs. The evaluation of all the etiologically important factors requires expert knowledge both in the principles of psychodynamics and pathology and in the principles of clinical medicine. I agree with the authors' emphasis in requiring that the modern gastroenterologist should be equally equipped in all these fields. The novel feature in this emphasis is the requirement of acquaintance with the principles of psychodynamics. Knowledge of clinical medicine and pathology has been for a long time a standard requirement. The fact that at present we are able to evaluate the specific role of emotional factors in the diseases of the gastrointestinal tract makes it imperative that our psychotherapeutic approach should be specific and etiologically oriented. Many patients suffering from gastrointestinal disorders can be helped by a simple ventilation of their emotional conflicts or by reassurance and rest; however, the physician should know why in certain cases such simple methods suffice and others require prolonged psychotherapeutic treatment. Without a specific knowledge of psychodynamics, the psychotherapy will remain the old hit-or-miss variety of treatment.

DR. SIDNEY A. PORTIS, Chicago: Drs. Vorhaus and Orgel have presented an approach to a problem that confronts all of us who are doing serious thinking. I am always concerned, when looking at a patient from a psychosomatic point of view, that I am overlooking some organic disease, and I tell myself that first, last and always I am a physician, and the responsibility for any oversight lies in my hands. However, after a serious intensive investigation, when one confirms an original suspicion that the problems of a patient are entirely psychogenic in origin, it is up to the physician to outline adequate care. Many patients cannot afford prolonged psychotherapy; on the other hand, a fairly large number will have to have some psychotherapy. In order that the patient should have the medical treatment that is adequate to meet this problem, I have developed a regimen which in my own hands has yielded me the best results I have seen in over twenty-five years in gastroenterology. One of the most perplexing factors in the clinical pictures of these patients is the question of fatigue. Twenty-one months ago I began studying fatigue and came to the conclusion that it was probably associated with a disturbance of the carbohydrate metabolism which has its origin in a presumed hypersecretion of insulin. This was evidenced by the so-called flat curve which resulted when intravenous glucose tolerance tests were made. I found that these patients became hypoglycemic at the end of the two hour test. Therefore the therapeutic approach to this problem was to maintain the high level of blood sugars at all times. In order that the hyperirritable glands of the pancreas should not be stimulated too rapidly, free sugar in any form was noticeably omitted from the diet. The complex carbohydrates, proteins and moderate fat satisfy the demand for this relatively high sugar at all times. During the course of these observations the question arose Could it be possible that the early morning pain of a duodenal ulcer is associated with this relative hypoglycemia? Patients were given a small feeding before retiring. These patients got atropine three times a day and an additional dose at bedtime. They have been completely free from symptoms during the early morning hours, with no neutralization. In addition, the fatigue which was such an important part of the clinical picture had definitely disappeared. In observations and studies of over 450 patients with psychosomatic disease, which now covers a period of over twenty-one months, I was struck by the fact that the incidence of coronary occlusion was relatively nil. Also I was

impressed by the improvement in the electrocardiographic findings of the middle aged group when these patients were subjected to this fatigue management. And, while I have no clinical proof for the conclusions, it might be well for all of us to begin to think seriously that there may be some relation between myocardial damage and coronary occlusion and levels of blood sugar.

DR. BENJAMIN M. BERNSTEIN, Brooklyn: I don't think we need fear that we shall have to turn all our cases over to the neuropsychiatrists; as a matter of fact, we don't even have to learn psychiatric management, because you and I have been treating our patients psychologically. Have you ever tried to analyze what faith is? Why does a patient say "I went to an awfully good doctor the other day. He spent one full hour with me." She has faith. You have hypnotized her in the belief that you are going to cure her. Another patient says "I went to a wonderful doctor the other day. Why, in five seconds he knew what was wrong with me!" Faith again. That is psychotherapy. Knowing the type of individual as he comes into your office, seeing how he walks, how he stands, how he sits and how he sweats, if you will, give a clue as to the kind of individual you are dealing with. Of course, we all go wrong, at times. We see persons who have gallstones, who are operated on for gallstones, and they don't get well! We explain by saying biliary dyssynergia, biliary stasis, chronic pancreatitis—I don't believe it matters. I believe we are dealing with individuals who have a particular kind of constitution, who have abdominal symptoms, if you will, not necessarily gastroduodenal, based on causes that we know little or nothing about. You may give the same patient the same medication the other fellow gave. With a bit of "salve" and some common sense, and a pat on the back, you are doing psychotherapy. We all have to be psychotherapists. I am afraid sometimes we may have to throw most of our abdominal conditions into the field of trophopathic disorders, even gallstones perhaps, particularly cholesterol stones, certainly colitis, even though secondary infection plays an important role, and most importantly, of course, gastroduodenal dyssynergia.

DR. GEORGE B. EUSTERMAN, Rochester, Minn.: As so large a percentage of patients with gastrointestinal disorders harbor no demonstrable organic lesions, every gastroenterologist also should have neuropsychiatric training. A preponderance of psychoneurotic patients have as their presenting complaint disturbances of a gastrointestinal nature. Unlike Dr. Palmer, I am strongly of the opinion that gastroduodenal ulceration, in the large majority of cases, has its origin in physical, nervous or emotional stress, or a combination of these factors. We can no longer dismiss the neurotic patient with the cheerless statement that there is nothing wrong with him and prescribe a sedative as a routine measure. Of course the psychotherapeutic value of a thorough, even though negative, examination by a physician in whom the patient has every confidence is generally recognized. We have postponed too long doing for these unfortunate individuals what for years we have done systematically for arthritic and diabetic patients for example, namely group instruction and treatment by lecture, demonstration and personal interviews. This is being successfully done at our state university, as it has been done in various Eastern institutions for some years. Following the exclusion of any significant organic disorder by the internist, which includes the application of all modern approved methods of examination, the neuropsychiatrist then takes charge. Among other things, the emotional factor underlying the complaint is determined and the patient given an adequate insight into the mechanism which gives rise to his physical disturbances as the result of a personality disorder. Usually after six to eight weeks recovery follows unless the patient is actually psychotic, uncooperative or the victim of a deep seated systematized neurosis. Finally, one is always faced with the problem of the psychoneurotic patient who also harbors an organic lesion, duodenal ulcer in particular. Not infrequently it is essential to determine which condition is paramount, the neurosis or the ulcer. We have all had the somewhat embarrassing experience of successfully healing by treatment or

removing by gastric resection lesions of the digestive or biliary systems only to realize that cure was not effected and that the patient sooner or later continued to complain as volubly as before.

DR. S. ZACHARY ORGEL, New York: In psychosomatic disorders we are not interested in obtaining as many facts as possible but in getting information that has not been prepared for the occasion. Thus one learns how the symptoms develop and what the symptoms meant to the patient from early childhood. He is stimulated to give the information by having him describe his organic complaints without making him aware of a psychologic background in his illness. He will give the material necessary for a proof of a psychosomatic unit in his illness only if he is not aware of what he reveals to us about his emotional life. The patient, if allowed to talk without being asked leading questions, will usually give a detailed account of his complaints and ideas about his illness. When he has exhausted his ideas and recollections about his organic disturbance, he will stop and wait to be questioned. After being certain he will not continue spontaneously, the examiner repeats one of the points of the patient's last sentence, in an interrogative form, care being taken to use the patient's words. New information centering around his symptoms is usually now stimulated. He drifts into giving a communication in which he inattentively mixes emotional and somatic material. References to persons in his environment, both from the present and from the past, then begin to appear. This usually is the beginning of a critical phase of the examination. Material will now appear which leads to the three essential points in establishing the psychosomatic unit: the old conflict, the recent conflict and the time factors. Persons first appearing are usually relevant from the psychosomatic point of view. Correlation of organic illness with the patient's emotional life now becomes evident. Thus we learn a great deal about the neurotic conflicts of these patients.

Clinical Notes, Suggestions and New Instruments

RETRO ORBITAL ADRENAL REST TUMOR

LEE W. HUGHES, M.D., AND ANTHONY AMBROSE, M.D.
NEWARK, N. J.

This case is being reported because of the apparent rarity of its occurrence. A search of the textbooks in ophthalmology at our disposal has failed to disclose a report of any such case. No doubt there have been others seen which probably were not reported.

The patient was a woman aged 21, whom we first saw March 21, 1944. Her past and present health had been good. She had measles, pneumonia and mumps during childhood. Her chief complaint was that the left eye had been gradually protruding forward, downward and inward since February 1939. At that time she was struck over the left eye with a hard packed snowball. There was a sharp stinging pain in the eye. Cold compresses were applied and by the next morning the eye felt better. She stated that it never became discolored. She did not have any further trouble until early in 1941, when she noticed a slight swelling over the left eye, which appeared at

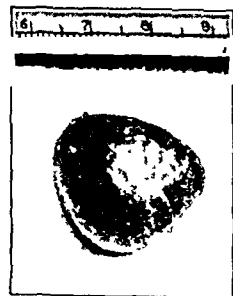


Fig. 1.—Tumor mass.

certain intervals. By the following year the swelling was more definite and she began to notice that the eyeball was protruding.

Examinations revealed that the vision in the right eye was 20/100, with correction 20/30; vision in the left eye was 20/70, with correction 20/30.

There was a moderate swelling of the left upper lid, especially in its outer two thirds. The eye was protruding downward,

slightly inward, and noticeably forward. The ocular motility was good; there was no diplopia. The condition was thought to be a hemangioma which resulted from the accident in 1939.

She was operated on under general anesthesia April 13, 1944, at the Newark Eye and Ear Infirmary. The external canthus was split directly outward to the edge of the orbit. The con-



Fig. 2.—Appearance before operation.

junctiva was open and dissected backward. The external rectus muscle was fixed with catgut and then severed near its insertion. Digital exploration of the retrobulbar space revealed the presence of a more or less olive shaped swelling behind and slightly above the globe. It seemed to be firmly fixed. A



Fig. 3.—After operation.

curved blunt pointed scissors was placed along the outer side of the bony orbit until the lateral border of the tumor was reached, and then with careful spreading of the blades the tumor was partially dislocated. The remainder of the dislocation was done with the small finger tip. There was surprisingly little bleeding. The conjunctiva was closed with interrupted silk

stitches. The external rectus was reattached. The skin was closed with interrupted black silk sutures. A pressure bandage was applied.

A section of the tumor was sent to Dr. Harrison S. Martland, who had the following to say after the examination:

"After examining a microscopic slide of the tumor removed from the orbit I am expressing the following opinions:

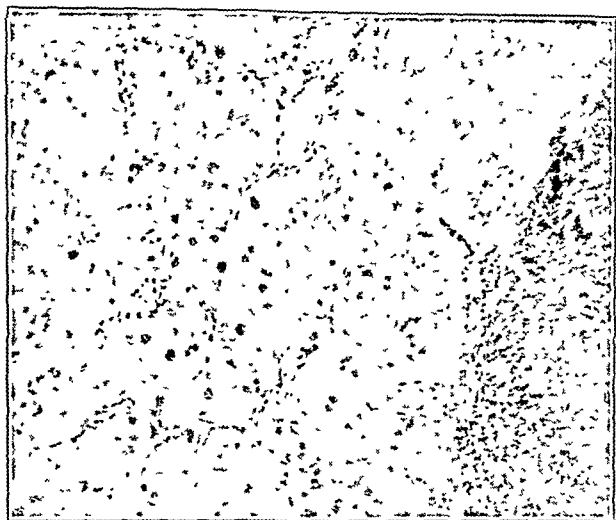


Fig. 4.—Section under low power.

"The tumor is well encapsulated and appears to be a benign tumor, in that there is absence of mitosis, hyperchromatism and other malignant features.

"The tumor is composed chiefly of cells which appear like liver cells or cells from the adrenal cortex, and these are arranged in a manner similar to zona fasciculata of the adrenal cortex, occasionally showing lumen formation.

"There are many areas of small round cells.

"I am inclined to interpret the tumor as a congenital fault somewhat in the nature of an adrenal rest (which has been

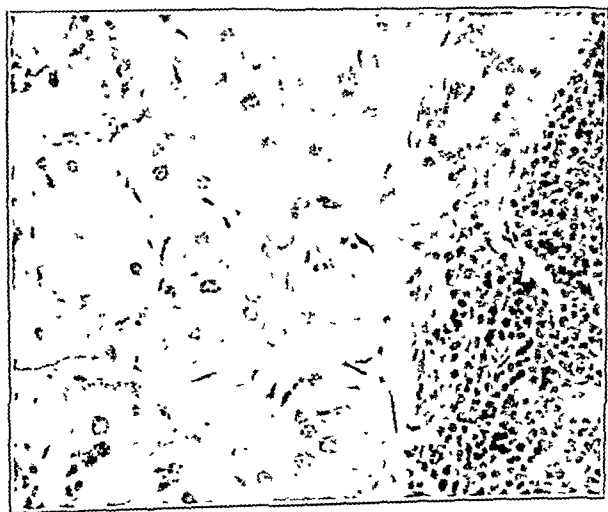


Fig. 5.—Section under high power.

described in the region of the head) and am apt to regard the collections of small round cells as probably of neurogenic origin."

Postoperatively the patient made an uneventful recovery. There was only a slight diplopia when looking to the extreme right, which disappeared within a few weeks.

965 Broad Street—31 Lincoln Park.

CONTINUOUS INTRAMUSCULAR INFUSION OF PENICILLIN

FRANKLIN I. HARRIS, M.D., SAN FRANCISCO

The methods of administering penicillin described in the current literature are (1) continuous intravenous infusion, (2) repeated intramuscular injections and (3) topical application. In none of this voluminous literature have I been able to find any description or recommendation for giving this valuable drug by continuous intramuscular infusion.

Continuous intravenous infusion is objectionable because of the special and constant nursing care required; the occasional formation of thrombophlebitis at the site of injection and finally the constrained position of the patient's arm for twenty-four hours a day limits his activity and comfort.

Repeated intramuscular injections of penicillin are disturbing and painful and often prevent a patient from receiving a sufficient amount of rest in a twenty-four hour period. The nursing care is likewise increased.

As penicillin became available to civilian hospitals in greater amounts, our two surgical residents Drs. Walter Leff and Lewis Karp suggested that we give penicillin to the patients in the surgical service by continuous intramuscular clysis. This suggestion was immediately accepted and since May 15, 1944 has been the method of choice for the administration of penicillin at the Mount Zion Hospital, San Francisco.

TECHNIC

The contemplated total dose of penicillin for twenty-four hours is dissolved in 1,000 cc. of sterile solution, exactly as in the preparation for continuous intravenous infusion. This solution is then allowed to run in by a drip method as an intramuscular clysis. One or both thighs may be utilized. The regular intramuscular clysis needles are used, and the outer or inner side of the thighs is the favorite site of administration as in any other type of intramuscular clysis. The usual rate of flow when 100,000 units has been dissolved in 1,000 cc. of saline solution is between twelve and fifteen drops per minute, which gives approximately 50 cc. per hour or about 5,000 units per hour. This rate of flow can be easily increased to give 10,000 units per hour or any desired dose. Many variations can be easily arranged. If more fluid intake is desired, the 100,000 units can be dissolved in two flasks of 1,000 cc. each.

This method requires no special nursing care, once the needle is inserted intramuscularly and the rate of flow established. The patient does not need close observation from this standpoint. Lately we have found it more advantageous to place the needle only in one leg. This permits the patient greater activity and movement in bed.

In the majority of cases we have averaged about 5,000 units per hour by intramuscular infusion throughout the twenty-four hour period. Our laboratories have not at the present time found it possible to determine the blood level and concentration of penicillin, but those of us who have used this method of administration believe that the penicillin effect is probably more evenly distributed and kept at a better level than by the repeated intramuscular injection. Further studies will have to be made in the future of the blood levels that are obtained by this method.

The clinical results with the continuous intramuscular method of administering penicillin have been eminently satisfactory in approximately 25 cases in which this method has been used from May 15 to August 1. There have been no complications, no abscess formation and no nursing difficulty that could be attributed to this method of administration.

This short note is submitted because it is believed that sufficient publicity has not been given to this safe and valuable method of administering penicillin.

450 Sutter Street.

From the Division of Surgery, Mount Zion Hospital

SUBACUTE BACTERIAL ENDOCARDITIS TREATED
WITH PENICILLIN

B. C. COLLINS, M.D., MEMPHIS, TENN.

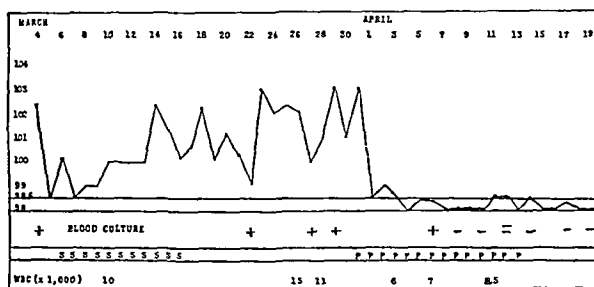
B. W. H., a white boy aged 10 years, was admitted to the Methodist Hospital Oct. 2, 1943 with a history of fever for the preceding four days and complaining of pain in the left lower chest, anorexia and general malaise.

X-ray examination at this time revealed a lobar pneumonia of the left lower lobe, infiltration of both hilar regions and slight enlargement of the heart, but no abnormality in contour.

Physical examination revealed an acute inflammation of the tonsils and tonsillar pillars. There was bronchial breathing and moderate dullness over the left lower lobe. Examination of the heart revealed a palpable thrill, a very loud blowing systolic and a subdued diastolic murmur about 2 centimeters to the right of the mitral area. These murmurs were not transmitted to the axilla or posteriorly. A tentative diagnosis of lobar pneumonia and congenital heart disease was made.

Laboratory studies showed 54 per cent hemoglobin, 2,950,000 red blood cells and 12,250 white blood cells, with a differential count of 76 per cent neutrophils, 23 per cent lymphocytes and 1 per cent large mononuclears. Urinalysis was negative. The corrected sedimentation rate by the Wintrobe method was 30 mm. in one hour.

Treatment consisted of one 300 cc. blood transfusion, sulfadiazine 1 Gm. immediately and 0.5 Gm. every six hours for two days, then 0.5 Gm. every twelve hours. The blood con-



Clinical course. S, sulfamerazine; P, penicillin.

centration was 12.9 mg. per hundred cubic centimeters on the second day of therapy. The clinical course was very satisfactory, the temperature returning to normal in seventy-two hours. The patient was discharged home on the ninth day, apparently cured.

The patient returned to the hospital on Feb. 9, 1944 with a fever of 104.2 F. A blood culture positive for *Streptococcus viridans* was obtained. X-ray examination at this time revealed an atypical lobar pneumonia of the right base. There was prompt and satisfactory response to sulfamerazine, 1.5 Gm. immediately and 0.5 Gm. every six hours for six days. The temperature dropped to normal on the second day of treatment but became elevated again four days after the drug was discontinued.

Blood cultures positive for *Streptococcus viridans* were obtained on February 11 and 29, March 22, 27 and 29 and April 6.

The patient received another course of sulfamerazine from March 6 to March 16 with little improvement, as shown in the accompanying chart.

Treatment with penicillin was started on March 31. The dosage was 100,000 Oxford units daily divided into eight equal parts and given every three hours intramuscularly. The total given was 1,400,000 units over a period of fourteen days. The response was rapid and very dramatic, the temperature dropping to 99 F. on the second day of treatment and becoming normal the following day. Negative blood cultures were obtained on April 8, 10, 12, 14, 16, 17, 19 and 24. The clinical improvement was excellent and on September 16 the patient was still afebrile and symptom free.

Council on Foods and Nutrition

ACCEPTED FOODS

The following additional foods have been accepted as conforming to the Rules of the Council on Foods and Nutrition of the American Medical Association for admission to Accepted Foods.

GEORGE K. ANDERSON, M.D., Secretary.

PREPARATIONS USED IN THE FEEDING OF
INFANTS (See Accepted Foods, 1939, p. 156).

Harold H. Clapp, Inc., Rochester, N. Y.

CLAPP'S (BABY FOODS) CUSTARD PUDDING.

Analysis (submitted by manufacturer).—Total solids 21.86%, fat (by acid hydrolysis) 2.73%, protein (N \times 6.25) 3.06%, ash 0.62%, crude fiber 0.006%, carbohydrates (by difference) 15.44%, calcium (Ca) 137.09 mg. per hundred grams, phosphorus (P) 92.72 mg. per hundred grams, iron (Fe) 0.5 mg. per hundred grams.

Calories.—0.99 per gram; 28.1 per ounce.

Vitamins.—Vitamin A (carotene) 156 U. S. P. units per hundred grams.

Vitamin B₁ (thiamine) 0.03 mg. per hundred grams.

Vitamin C (ascorbic acid) 0.34 mg. per hundred grams.

Vitamin G (riboflavin) 0.38 mg. per hundred grams.

Harold H. Clapp, Inc., Rochester, N. Y.

CLAPP'S STRAINED PEACHES.

Analysis (submitted by manufacturer).—Total solids 14.53%, protein (N \times 6.25) 0.43%, ash 0.37%, crude fiber 0.09%, fat (ether extract) 0.06%, carbohydrates (by difference) 13.58%, phosphorus (P) 16.6 mg. per hundred grams, calcium (Ca) 4.8 mg. per hundred grams, iron (Fe) 0.37 mg. per hundred grams, copper (Cu) 0.10 mg. per hundred grams.

Calories.—0.57 per gram; 16.2 per ounce.

Vitamins.—Vitamin A (carotene) 169 U. S. P. units per hundred grams.

Vitamin B₁ (thiamine) 0.02 mg. per hundred grams.

Vitamin C (ascorbic acid) 2.0 mg. per hundred grams.

Vitamin G (riboflavin) 0.3 mg. per hundred grams.

Harold H. Clapp, Inc., Rochester, N. Y.

CLAPP'S STRAINED PEARS.

Analysis (submitted by manufacturer).—Total solids 15.61%, crude fiber 1.02%, protein (N \times 6.25) 0.56%, ash 0.21%, fat (ether extract) 0.08%, carbohydrates (by difference) 13.74%, phosphorus (P) 14.2 mg. per hundred grams, calcium (Ca) 8.5 mg. per hundred grams, iron (Fe) 0.69 mg. per hundred grams, copper (Cu) 0.09 mg. per hundred grams.

Calories.—0.58 per gram; 16.5 per ounce.

Vitamins.—Vitamin C (ascorbic acid) 0.74 mg. per hundred grams.

Vitamin G (riboflavin) 0.03 mg. per hundred grams.

Gerber Products Company, Fremont, Mich.

GERBER'S CHOPPED VEGETABLE AND LAMB WITH BARLEY, consisting of potatoes, water, carrots, lamb, green beans, pearl barley, barley flour, onion powder and salt.

Analysis (submitted by manufacturer).—Moisture 86.8%, ash 1.2%, fat 2.2%, protein 2.4%, crude fiber 0.4%, carbohydrates (by difference) 7.0%, Ca 0.010%, P 0.040%, Fe 0.0009%, Cu (?) ?.

Calories.—0.6 per gram; 16 per ounce.

Vitamins.—Protocols of assay (1941) show that this product contains 900 international units of vitamin A, 0.032 mg. of thiamine and 2.3 mg. of ascorbic acid for each hundred grams.

Gerber Products Company, Fremont, Mich.

GERBER'S CHOPPED VEGETABLE AND LIVER WITH RICE, consisting of potatoes, water, celery, tomato pulp, beef liver, carrots, rice, salt and onion powder.

Analysis (submitted by manufacturer).—Moisture 88.7%, ash 1.3%, fat 0.3%, protein (N \times 6.25) 2.6%, crude fiber 0.3%, carbohydrates (by difference) 6.9%, Ca 0.015%, P 0.044%, Fe 0.0013%, Cu 0.00031%.

Calories.—0.4 per gram; 12 per ounce.

Vitamins.—Protocols of assay (1941) show that this product contains 8,100 international units of vitamin A, 0.074 mg. of thiamine and 1.5 mg. of ascorbic acid for each hundred grams.

Gerber Products Company, Fremont, Mich.

GERBER'S PINEAPPLE-RICE PUDDING (JUNIOR FOODS).

Analysis (submitted by manufacturer).—Moisture 74.36%, ash 0.85%, fat 0.62%, protein (N \times 6.25) 1.67%, crude fiber 0.20%, carbohydrates (by difference) 22.30%, calcium 0.0416%, phosphorus 0.0378%, iron 0.00085%, copper 0.00004%.

Calories.—1.02 per gram; 29 per ounce.

Vitamins.—Carotene, 0.0135 mg. per hundred grams.

Thiamine, 0.034 mg. per hundred grams.

Ascorbic acid, 0.78 mg. per hundred grams.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO 10, ILL.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, SEPTEMBER 23, 1944

POSTWAR TRAINING FOR RETURNING OFFICERS

Elsewhere in this issue is a preliminary estimate, prepared by the Council on Medical Education and Hospitals, of the probable demand for advanced graduate training by returning medical officers. The report suggests ways in which efforts may be applied to meet the need. Returns on the questionnaires sent to all medical officers are now being received in numbers which clearly reflect the widespread interest in continuation training. Analysis of an early random sample has already been published.¹ Such data are indispensable for effective planning.

Probably 10,000 medical officers will want house officer training of six months or more. Since demobilization will probably extend over some time, the number of additional places required will probably approximate 5,000 during the first year. Apparently most expansion will be required in otolaryngology, surgery, obstetrics and gynecology and ophthalmology, which may need to double their facilities. Expansions of 50 to 70 per cent seem to be indicated in urology, internal medicine, orthopedic surgery and pediatrics.

Somewhat fewer officers are likely to seek shorter courses; about 9,000 officers will seek full time training of one to six months' duration. In 1943-1944 there were nearly 27,000 physicians enrolled in such courses. However, over 90 per cent of these were in short courses of about a month. Apparently more than 90 per cent of those desiring review or refresher courses will seek training in somewhat longer courses of two to six months' duration. Many more courses of that duration will be required.

In the light of the figures given, all institutions which can contribute to meeting the need are obligated to review their resources and prepare estimates of the additional facilities they can provide, to facilitate the achievement of the program outlined (page 257).

The communication from Col. Perrin H. Long, published on page 239 of this issue, further underscores

the deep concern of medical officers with regard to their further training after the war and indicates that the work being carried out by the Committee on Postwar Medical Service meets a real demand. The suggestions of Colonel Long are similar to the program already being developed. With continuing cooperation of the Committee on Postwar Medical Service, the Council on Medical Education and Hospitals, the Surgeons General of the armed forces, medical schools, American boards in the medical specialties and others primarily concerned, there is every reason to expect that the needs will be met. Information now being collected from all educational institutions will be made available in the near future. In the meantime, medical officers can be assured that every effort is being made, and with success, "to cut through to the goal, because then, with the facts before them . . . [medical officers] . . . will be able to plan their existence in the postwar world."

CHANGING FOOD HABITS FOR BETTER NUTRITION

Somebody is always trying to change the eating habits of the American people. Sometimes the stimulus comes from a food faddist who has made up his or her mind that health lies in abstinence from meat or acid fruits or eggs or some other food that has been for years eaten by great numbers of people. Sometimes the urge comes from an agency like the American Meat Institute, the National Confectioners' Association or the manufacturers of cereals or of dairy products or the bakers of bread, telling us that we ought to eat more of their particular products. Associated with these campaigns are the promulgations of groups of scientists or nutritional authorities who want everybody to be quite familiar with the vitamin, mineral, protein, carbohydrate and fat content of everything they eat and to eat strictly according to formula.

Recently a reaction has been voiced in Great Britain against present trends in eating, led largely by Lord Thomas Horder, who is president of the Food Education Society. Lord Horder¹ said that the overweighting of food education by the appeal to science has induced in many people a spirit of antipathy. They feel that eating and drinking were never intended to be subject to chemical equations. Lord Horder has emphasized the factor of safety in the human body in relation to nutrition. He said, as quoted by the *Lancet*:²

Health is not a tight-rope and our bodies are neither anxious nor solicitous; they are not puritanical; they will dine with publicans and sinners and often, though not always, come away none the worse, but even better. Our bodies are wonderfully adaptable, they will tolerate a large range of strains and stresses. This is not to say that we can continue to abuse our bodies over a long period. But this "balancing" of our diet is sometimes taken too far. The principle is sound and it

1. Lueuth, H. C.: Future Educational Objectives of Medical Officers, *J. A. M. A.* 125:1099 (Aug. 19) 1944.

2. Joy Through Food, editorial, *Lancet* 2:47 (July 8) 1944.
2. Cautious Food Reform, extract from Lord Horder's presidential address to the Food Education Society, *Lancet* 2:53 (July 8) 1944.

needed stating, even stressing. Balance the diet by all means; to balance the day's food is not a bad idea; but to balance the individual meal is not necessary at all. . . .

This statement by Lord Horder should give pause particularly to the pronouncements that now assail us constantly over the radio, telling us that this or the other product takes care of all of our deficiencies of vitamins or of minerals or of both. People are likely to get from these announcements the notion that every one is deficient in something or other and that the only hope of health is a superabundance of all the known vitamins and minerals. For them Lord Horder has a special caution:

. . . We should teach a little less than we think we know, rather than strain the few facts of which we seem certain to explain conditions which are complex and probably result from more factors than the few that have been revealed to us.

Supplementing the statement by Lord Horder is one by F. Le Gros Clark,³ who at some length analyzed food habits and how to change them. The eating habits of people are for the most part traditional. Children learn to enjoy certain foods in their homes and carry their prejudices over to adult life. Many of the food habits are a reflection of factors that have nothing whatever to do with the science of nutrition:

Most of those who lecture or write on nutrition are members of the professional classes (research workers, doctors and teachers), whereas most of those who receive the message are the families of miners, dockers, railway men, farm workers and the like. For food habits the latter have acquired in the process of generations there is always a set of comprehensible causes, among which are not only mistaken or outworn ideas about correct diets but also such factors as storage space, cooking facilities, income levels and meal-times.

Our eating habits are affected by the ability of housewives in general and of cooks to cook. Many a mother has pretty definite ideas about what is good for the family in the way of food, but the preferences of the father and the children are more likely to dictate the dietary than the mother's knowledge of scientific nutrition. If the father and the children refuse to eat turnips or squash or beet tops, the mother gains little by serving these items.

Since established habits of eating are hard to change, more emphasis should be placed on desirable traits in the early impressionable years. The stress on proper feeding of infants and children over the past several years should soon be paying dividends in better eating habits in the younger generation. The gains made should be maintained. Without change in established eating habits, improvement will come from the continuation and expansion of the food enrichment program. Such generally eaten foods as bread, flour, cereals and milk become effective carriers of nutrients which are known to be commonly deficient in diets of the general population. Without change in character of the food, its nutritional value to the consumer is enhanced.

The impositions and restrictions of wartime are without permanence. When restrictions are released, people will go back again to eating what they like. Even the law cannot make people enjoy eating something they do not like. But some benefits on our national nutrition will undoubtedly result from the war aside from the increased scale of food production. There will be new types of food available as a result of research and innovations in transportation. Old familiar foods will be made more attractive to the eye and the palate. The sum total of our wartime food experience can hardly be other than good. Nutritionists and others concerned with the correction of our nutritional delinquencies may extend the gains thus far made. No doubt a planned state would provide community kitchens and dining rooms in which the workers and their families would eat exactly what the nutritionists put out for them, but as long as our civilization continues to be based on the family, food habits are going to control eating.

THE PREVENTION AND TREATMENT OF FETAL ERYTHROBLASTOSIS

Fetal erythroblastosis in by far most cases appears to be the result of Rh incompatibility on part of the father and the mother. Does the demonstration of such incompatibility bring with it practical means for the prevention and cure of erythroblastosis?

At present the main if not the only means of successful prevention would be the avoidance of impregnation of an Rh negative woman by an Rh positive man. The immediate cause of Rh erythroblastosis is the destruction of red corpuscles of the fetus by specific antibodies from the blood of the mother; the question has been raised whether it is possible to remove the antibodies in the mother's blood by injecting the antigen, that is, blood containing the Rh factor. Broman,¹ who has made extensive studies on the Rh factor, introduced blood from the Rh positive father into the isoimmunized Rh negative mother, with an apparently wholly negative result. Further and comprehensive experiments along this line seem indicated. Possibly effective methods of removing antibodies from the mother's blood may be found if the Rh substance becomes available in adequate quantities. In experiments it has been shown that removal of different antibodies from the blood of immunized rabbits readily results from the intravenous injection of the corresponding antigen.

Henceforth special care must be taken in blood transfusion of prospective mothers. Rh negative women in the childbearing age should not be transfused with Rh positive blood because, if done, Rh antibodies may be produced which can cause erythroblastosis in a subsequent Rh positive fetus. The sensitization of an

3. Clark, F. Le Gros: Food Habits and How to Change Them, *Lancet* 2: 53 (July 8) 1944.

1. Broman, Birger: The Blood Factor Rh in Man: A Clinico-serological Investigation with Special Regard to Morbus Hemolyticus Neonatorum (Erythroblastosis Fetalis), *Acta pædiat.* 31, Supp. II, 1944.

Rh negative woman to the Rh factor may be harmful to the future offspring.

In the case of Rh incompatible couples with previous erythroblastic episodes, the mother may be tested at intervals for Rh antibodies if pregnancy occurs again with a view to producing premature viable birth, should the results be increasingly positive. As yet the suggestion has not been approved by obstetricians. The experience so far indicates "that nothing is to be gained by premature delivery."² Whenever there is reason to fear erythroblastosis, arrangements should be made so that if necessary transfusion of the child with suitable Rh negative blood can be done as soon after birth as possible. There are as yet no methods available for intrauterine control of erythroblastosis. Treatment can be given after birth only. Since some 50 per cent of children with erythroblastosis die before they are 7 days old¹ the earlier proper treatment is given the better. The treatment of choice³ is the introduction of Rh negative blood—a substitution treatment. Rh negative blood of the same group as that of the infant is used because there may be anti-Rh bodies in the blood and tissues of the child. Fortunately suspensions of the mother's red cells can be used after thorough washing in salt solution to remove all traces of the plasma. It has been recommended that infants with erythroblastosis be not nursed by their mothers because the milk may contain anti-Rh bodies.⁴ It was noted long ago that infants with erythroblastosis did not thrive on the mother's milk. The results of prompt transfusion in erythroblastosis are favorable.⁵ In Javert's series the case death rate was reduced from 73 to 14 per cent.

EXIT TALCUM FROM THE SURGICAL SCENE

From the earliest days of the emergence of surgery in the fertile valley of the river Nile down to Ignatz Semmelweis's epochal discovery, surgeons with few exceptions shared with the rest of humanity the title of the "great unwashed." Then, in 1861, hand washing emerged from the realm of Mosaic ritual into the sphere of inviolable surgical technic. About forty years later came the discovery, after Pasteur's and Lister's investigations, that mere hand washing was not adequate protection either for patient or for surgeon; therefore sterile cotton or lisle gloves were added to the surgical armamentarium. Only a few years later Halsted supplanted fabric with rubber gloves sterilized by boiling

and put on under sterile water or a suitable antiseptic solution. This technic in turn, and in short order, was replaced by steam autoclaving of the rubber gloves and donning them when dry, with the aid of the generous use of talcum powder. This powder was dusted inside the gloves before and also after sterilization, and on the hands of the surgeon before slipping them into the gloves.

That talcum and similar powders are not innocuous has been known for well over half a century. In 1881 Hippolyte Martin¹ described the potentially grave hazards incident to the use of these powders. Only well within the past ten years, however, have surgeons and pathologists recognized the dangerous properties of talcum powder. More than a score of studies have been published detailing the serious consequences that follow the entrance of talcum powder into animal tissues by way of operative wounds, the peritoneal cavity, the brain, the rectum, the vagina or the cervix and through numerous other routes.

The resultant lesions follow a definite structural pattern, which initially is that of the usual foreign body reaction represented by tubercle-like formation, with talc crystals demonstrable in most of the tubercles. This demonstration is greatly facilitated by the use of polarized light. Later a fibrosis occurs. Naturally when these processes occur in the peritoneal cavity they lead to peritoneal adhesions frequently causing intestinal obstruction. These lesions are permanent because the body does not have adequate reparative power against talcum, which is essentially a silicate and which therefore induces a silicosis.

The evils of talcum manifest themselves most tragically in the field of abdominal surgery in the form of postoperative intestinal obstruction. German² studied a series of surgical patients by removing biopsy specimens from the omentum in 50 cases in which laparotomy had been done. Using polarized light technic he demonstrated the presence of talc crystals in 80 per cent of the specimens. These results of German's study furnish startling and disturbing evidence of the frequency with which talcum escapes into the peritoneal cavity during operative procedures. It does not always follow, of course, that the presence of intraperitoneal talcum invariably causes symptoms of grave abdominal disease; but it requires no stretch of imagination to grasp the possible hazards attendant on the presence of a siliceous powder in the peritoneal cavity.

Despite these hazards, however, and despite an appreciable wealth of scientific literature on the subject, investigators³ at the Barnard Free Skin and Cancer Hospital of St. Louis were the first to

2. Potter, Edith L.: The Present Status of the Rh Factor, *Am J. Dis. Child* 65: 32 (July) 1944.

3. Davidsohn, I.: The Rh Factor, *M. Clin. North America*, January 1944, p. 232.

4. Gim-on, J. D.: Hemolytic Disease of the Newborn (Erythroblastosis Fetalis). Its Treatment with Rhesus Negative Blood, *Brit. M. J.* 2: 293, 1943. Javert, C.: Erythroblastosis Neonatorum. An Obstetrical Pathological Study of 47 Cases, *Surg., Gynec. & Obst.* 74: 1 (Jan) 1942. Further Studies on Erythroblastosis Neonatorum of Obstetrical Significance, *Am J. Obst. & Gynec.* 3: 921 (June) 1942. Witelsky, Ernest, et al.: *Am J. Obst. & Gynec.* 49: 179 (Feb) 1942. Anderson, G. W., and Heide, Arne: Demonstration of Rh Antibody in Breast Milk, *Proc Soc Exper Biol & Med* 49: 179 (Feb) 1942. Potter, E.

5. Gim-on, J. D.; Javert, C.

1. Martin, Hippolyte: Nouvelles recherches sur la tuberculose spontanée et expérimentelle des sereuses, *Arch. de phys. norm. et path.* 8: 49, 1881.

2. German, W. M.: Dusting Powder Granulomas Following Surgery, *Gynec. & Obst.* 76: 501 (April) 1943.

3. Seelig, M. G.; Verda, D. J., and Kidd, F. H.: The Talcum Powder Problem in Surgery and Its Solution, *J. A. M. A.* 123: 955 (Dec) 1943.

substitute an innocuous powder for the troublesome talcum. These workers present evidence favoring the use of potassium bitartrate (cream of tartar) as a desirable and safe substitute for talcum. This salt is readily disposed of by the body fluids and tissues within a few hours and has the added advantage of being bacteriostatic in its action. It does not deteriorate rubber, but it is a bit more costly than talcum powder. In a later contribution the Barnard Hospital workers⁴ announced the discovery by which corn starch can be robbed of its gelling property and thus rendered even more suitable as a dusting powder than is potassium bitartrate, because it is smoother in texture and is more readily disposed of by the diastase mechanism of the body. This new, nongelling starch cannot be manufactured until after the cessation of war, owing to problems of priorities. In the meantime the somewhat more costly potassium bitartrate will serve. In any event the surgical scene seems to be set for the exit of talcum.

HEAT PRODUCTION ON MIXED DIETS

During the last decade Forbes and his associates¹ of the Institute of Animal Nutrition, Pennsylvania State College, have collected experimental evidence that with animals on equicaloric mixed diets progressive decrease in total heat production is associated with increases in protein percentage. This is contrary to general clinical belief, which assigns a dominant thermogenic role to protein. Forbes and Swift² have emphasized the possible bearing of these results on current problems of military dietetics and animal husbandry.

Total heat production was measured in selected groups of white rats during seven hour experimental periods on two consecutive days, the animals sleeping during most of the period. The first determinations were made with the animals on a minimum basal diet. The experiment was repeated seven days later with the same rats on the same diet plus measured amounts of beef protein, dextrose or lard, tested alone or in combination. The increased heat production on the supplemented diets was taken as a measure of the energy expense of utilization of the supplement. Accepting this interpretation, the net energy value of the supplement was calculated by subtracting this caloric expense of utilization from the gross caloric value of the supplement.

When fed alone it was found that 32 per cent of the total caloric value of beef protein was expended as necessary expense of utilization. With dextrose 20 per cent of the total caloric value was thus expended and with lard 16 per cent. The calculated net energy values of these three foods were protein 68 per cent of the gross caloric value, carbohydrate 80 and fat 84.

When these three foods were mixed, however, the heat production (energy of utilization) was much less than that computed from the individual food components. Thus, with a mixture of approximately equal parts of beef protein and lard but 11 calories of energy was necessary for utilization, as compared with 24 calories calculated for the individual components, a reduction of 54 per cent in the energy expense of utilization. Dextrose plus lard led to an "economy of utilization" of 35 per cent, dextrose plus protein 12.5 per cent and dextrose plus protein plus lard 22 per cent. It is evident from these data that in mixed diets carbohydrate is the major thermogenic factor, while lard is the major factor conferring economy of utilization.

The results of this study suggest that there is no special reason for decreasing the protein content in tropical military diets. Any desired decrease in heat production should be accomplished first by diminishing the carbohydrate, second the protein and last of all the fat in the routine mixed diet. The study also emphasizes present economic losses in animal husbandry. Manufacturing processes which skim off the fat content of by-product feed not only lower the net energy value of the feed through diminishing its gross caloric value but also decrease its net nutritional value by increasing the caloric expense of its utilization.

No adequate theory has thus far been suggested to account for the observed antithermogenic effects of fat in a mixed diet.

CONGENITAL CATARACT AND OTHER ANOMALIES FOLLOWING GERMAN MEASLES IN THE MOTHER

Gregg reported in 1941 at the annual meeting of the Ophthalmological Society of Australia a series of 78 cases of congenital cataract occurring in babies between December 1939 and January 1941. With few exceptions their mothers had suffered during the early stages of pregnancy from an exanthematous disease diagnosed as rubella. Many of the babies were of small size, ill nourished and often difficult to feed. In 44 of them a congenital lesion of the heart also was detected, in 10 the heart was apparently normal and in the remainder the cardiac condition was not recorded. The cataracts were of dense nuclear type; in 62 cases they were bilateral and in the remainder unilateral. In 11 of the 16 monocular cases the affected eye was microphthalmic. There was no similarity in the appearance of the cataracts to any of the morphologic types of congenital and developmental opacity reported previously.

Swan and his collaborators¹ investigated, under the grant from the National Health and Medical Research Council, children born in South Australia of mothers

4. Seelig, M. G.: Dusting Powder for Surgical Gloves, J. A. M. A. 125: 1208 (Aug. 25) 1944.

1. Forbes, E. B., and others: J. Nutrition 10: 461, 1935; 15: 285, 1938; 18: 47, 57, 1939; 20: 47, 1940.

2. Forbes, E. B., and Swift, R. S.: Science 90: 476 (June 9) 1944.

1. Swan, Charles; Tostevin, A. L.; Moore, Brian; Mayo, Helen, and Black, G. H. Barham: Congenital Defects in Infants Following Infectious Diseases During Pregnancy, with Special Reference to the Relationship Between German Measles and Cataract, Deaf-Mutism, Heart Disease and Microcephaly, and to the Period of Pregnancy in Which the Occurrence of Rubella is Followed by Congenital Abnormalities, M. J. Australia 2: 201 (Sept. 11) 1943.

who had suffered from exanthematous disease during pregnancy. Of 61 infants examined, 36 were found to have congenital defects. The mothers of 49 infants had suffered during pregnancy from rubella, 4 had no knowledge of any exanthem during this time, 9 contracted measles during pregnancy and 2 suffered from mumps. In the cases of rubella during pregnancy 31 of the infants born subsequently exhibited congenital defects. The abnormalities included cataract, deaf-mutism, heart disease, *microcephaly* and mental retardation. With 2 exceptions all of the 31 mothers with congenitally defective children had contracted rubella within the first three months of pregnancy. No congenitally defective babies were born subsequent to the occurrence of measles in pregnancy. One case is recorded of congenital corneal opacity following mumps.

Gregg noted that the epidemic of German measles in 1940 which gave rise to most of these cases was of greater severity and was more often accompanied by complications than previous epidemics of his experience. In some of the cases of the series investigated by Swan and his associates the general constitutional symptoms and the occurrence of complications were more pronounced than usual. The Swan committee gained the impression that the disease was sometimes more intense in mothers who later gave birth to congenitally defective infants than in those whose children were born healthy. The severity of the epidemic of German measles of 1940 was probably caused by the war conditions, large numbers of susceptible recruits being herded together in military camps. The disease spread rapidly, and the causative agent may have reached a higher stage of virulence. Several investigators have shown that avian and mammalian embryos exhibit a much higher susceptibility to infectious agents than adult tissues. Possibly the human embryo possesses the same susceptibility to infection, and the etiologic factor of German measles, after penetrating the chorionic barrier, is capable of producing severe lesions in the embryo, whereas the same infection in the adult tissues of the mother leads to only minor effects. Data gathered by Swan and his collaborators suggest that the chances of giving birth to a congenitally defective child when a woman contracts rubella within the first two months of pregnancy are almost 100 per cent, and if she contracts rubella in the third month they are about 50 per cent.

Now Reese² reports from New York City congenital heart lesions in 3 infants. The mothers of these 3 infants contracted German measles within the first month of pregnancy, which was during a rather severe epidemic of German measles in the East about one and a half years ago. This author raises the question whether the exanthem in the mother was German measles and, if it was German measles, why congenital anomalies in the

children so infected have not been observed before. A probable answer is that the congenital anomalies in his cases are the result of a more virulent or probably altered type of virus, which may have gained access to this country through an increased traffic with Australia.

Current Comment

HOSPITAL FACILITIES FOR TREATMENT OF ALCOHOLISM

An exhaustive report¹ on the institutional facilities available in this country for the treatment of alcoholism has recently been prepared by a committee of the American Hospital Association; its conclusions can be accepted as the basis for further study and active implementation. Hospital facilities for the care and treatment of alcoholic addicts in the United States are scanty and inadequate, and those which exist are not always utilized to the best advantage. The placement of patients in institutions has depended to a greater extent on the admission policies of hospitals, economic status of the patient, and how much of a nuisance he has been to his family or to the public than it has on the type of medical management best suited to his case of inebriety. Furthermore, there has been a lack of understanding of the necessity of research directed toward the evaluation of various technics of treatment, of the need to explore new methods of therapy and the necessity of greater education of physicians and those in allied professions in the sound handling of the problem drinker. The main point of attack, it is stated, should be through the general hospital. The completeness of the facilities of the general hospital and its accessibility make it the most logical place to which an alcoholic addict or his family would turn. The alcoholic addict, like other patients suffering from acute manifestations of an underlying chronic disorder, should not be denied the advantage of a thorough study of the cause, or causes, of his condition, or advice as to the means by which it can be best treated. Although some general hospitals may object to including facilities for patients with alcoholism, the report emphasizes the overwhelming arguments for the extension of their use in this manner. The report recommends that the trustees of the American Hospital Association appoint a committee to translate the suggested program into action; its scope should include the dissemination of facts, the stimulation of discussions of the problem, the setting up of selected hospitals as experimental units for testing the possibility of incorporating the treatment of alcoholic addicts into a well integrated plan and the promotion of clinics in outpatient departments and representative hospitals. In view of the profound effect which alcoholism has on a large and often otherwise useful segment of the population, the recommendations of the committee should receive active support by individuals, philanthropic foundations, general hospitals and all others who can exert any influence on this probably growing medical and social problem.

² Reese, Algernon B.: Congenital Cataract and Other Anomalies Following German Measles in the Mother, *Am J Ophth* 27:483 (May) 1944.

1. Corwin, E. H. L., and Cunningham, Elizabeth V.: *Institutional Facilities for the Treatment of Alcoholism*, *Quart. J. Stud. in Alcoholism* 5:9 (June) 1944.

MEDICINE AND THE WAR

GRADUATE MEDICAL TRAINING IN THE POSTWAR PERIOD

To the Editor—While looking over the "Program of the One Hundred and Sixty-Third Anniversary of the Massachusetts Medical Society," I noted that Dr. Allen O. Whipple was to present a paper on the subject of "How Shall We Provide Postgraduate Training in Surgery for Men at Present Serving in the Armed Forces?" While I have not had the privilege as yet of reading Dr. Whipple's address, I would like to discuss, from the point of view of a medical officer in an overseas theater of operations, the problem of postgraduate medical education for doctors who at some future period will be demobilized from the armed forces.

During the past year I have had repeated opportunities to discuss this problem with those who are most concerned with it, namely the doctors who staff the medical services of squadrons, battalions, regiments, divisions, corps, armies and those whose duties are of a nonprofessional nature in administrative sections and depots. In addition, this question has been reviewed with doctors in field, evacuation, station and general hospitals. It is believed from these discussions that an attempt can be made to gauge the cross section of opinion of these doctors on the problems of postwar professional rehabilitation, their reactions toward what has been accomplished so far in this direction and to formulate the tentative desires of at least a section of the doctors in the armed forces in respect to what they would like in the way of postwar postgraduate medical education.

It seems quite clear that most of the doctors whose tour of duty has been a professional one in station or general hospitals for the greater part or all of their service in the armed forces will require much less professional rehabilitation than those who have been in field service or administrative positions. Hence for doctors who have been in hospitals, short intensive postgraduate courses dealing with cardiology, degenerative diseases, metabolic and endocrinologic disturbances would seem desirable. These men have not lost that type of analytic reasoning which is based on the correct evaluation of all factors involved and which is necessary for arriving at the diagnosis and forms the basis for the treatment and prognosis of disease.

The problems of doctors who have been in field or administrative services are entirely different. These are the men whose closest contact to professional practices for periods which in some instances amount to four years has been to hold sick call if they are field service doctors or none at all, as is the case with many of the doctors who hold administrative positions. Experience has shown when these men are rotated to positions as ward doctors in station or general hospitals, that from three to six months is required to reeducate them in analytic reasoning and to restore their confidence in their professional ability. This observation gives a definite clue to the length of the periods of instruction which will be required and programs for rehabilitation should be formulated so that these doctors will receive carefully supervised ward and outpatient work with patients, together with formal ward rounds, clinics and lectures on special topics, x-ray and clinical pathologic conferences and journal clubs during their period of postgraduate instruction. These men have had little opportunity to acquaint themselves with the advances in medicine which have been made since 1940. Because of their long separation from professional practices these field and administrative medicine officers should be given a first priority on all courses in postgraduate instruction, and this priority should be continued until demobilization is complete.

Then there is a third group of doctors with whom we should concern ourselves and whose problems are not so well understood by those of us who have long been without the continental limits of the United States. These are the young men who have undergone a forced acceleration of their medical education and hospital experience in medical schools and hospitals whose staffs have been woefully depleted during the past three years. One can judge these young doctors only by their performance,

and to date our experience with them has not been broad enough to warrant any conclusions being drawn. However, it seems logical to assume that their foundation in medicine is less adequate than the foundation of those who graduated prior to June 1942. For these young men definite plans for further instruction must be made, otherwise they will be on the market at a dime a dozen in the competition for internships and residencies which will arise in the postwar period, and unless suitable preparations for their reception back into hospital training are made a chaotic situation characterized by disappointment, bitterness and resentment on the part of these young men to their chosen profession will arise.

That the future of our profession in a large measure is dependent on the maintenance of high standards of professional practice is well recognized by the doctors in the armed forces and is the reason why they are hoping and one might even say praying that means will be afforded for the professional rehabilitation which will be necessary if our standards are to be maintained in the postwar period. It is at this point that emphasis must be laid on the point that these doctors are beginning to develop an attitude of hopelessness toward their chances of postwar postgraduate education because of the lack of a specific program for rehabilitation which would permit them to begin to lay plans for the future. One looks in vain in the Report of the Committee on Postwar Medical Service (*THE JOURNAL*, June 24, p. 567) for a real ray of hope. All that one finds, and I quote, "Authorization has now been obtained to send a somewhat revised questionnaire to all medical officers in the Army, Navy and Public Health Service." I think it is safe to say that these questionnaires will receive a very favorable response. It will make the medical officers feel that they are not forgotten men. "The committee submits this report of a record of a year's humble but earnest endeavor." A questionnaire to make medical officers realize they are not forgotten men! Furthermore, in the President's address (*THE JOURNAL*, June 17, p. 461) the statement is made that "the Association is doing everything in its power to safeguard the quality and standard of medical practice during your absence and will do everything in its power to aid you when you return. The Council on Medical Education and Hospitals has made an extensive study of existing facilities for graduate medical education and is giving thought to the establishment of further facilities so that medical officers who have had an abbreviated internship or whose residency was interrupted may, on return, complete their education." These are hopeful phrases to be sure, but if the study has been made why not immediately publish its results so that doctors in the armed forces may begin to plan for the future and instead of giving "thought to the establishment of further facilities" for medical officers who have had abbreviated training, why not say that they will be made available and by utilizing the prestige and power of the Association create promptly a reality from the thought?

It is not that doctors in the armed forces are critical or resentful of the effort being made by the Association in their behalf, they are merely skeptical of its realization. While it would be foolish to presume to answer for all the doctors in the armed forces a cross section of the opinions of a rather large group of doctors in the armed forces would lead one to believe that the following specific information should be made available in the very near future to these men:

What facilities will exist for further hospital or postgraduate training in the demobilization period?

(a) What medical schools and hospitals will provide such training?

(b) What will be the length of the periods of training and postgraduate courses?

(c) What will be the content of the training and postgraduate courses?

(d) Where will one be able in the near future to obtain information in respect to postwar training?

(e) When and where will one make application for this training?

(f) What will be the cost of this training and will it be subsidized by private or governmental agencies?

The complexity of these problems is well understood by the doctors in the armed forces, but they feel that every effort should be made to cut directly through to the goal, because then, with the facts before them, they will be able to plan their existence in the postwar period.

PERRIN H. LONG, Colonel, M. C., A. U. S.

ARMY

HOSPITAL SHIP PATIENTS WRITE IN PRAISE OF EXCELLENT CARE

The War Department announced that letters written by patients who have returned to the United States from the fighting fronts aboard army hospital ships show the sincere gratitude these sick and wounded men feel for their treatment during the ocean voyage. Some of these letters were addressed to the senior medical officer aboard ship or to the master.

The Transportation Corps, responsible for the operation of these floating hospitals, has twenty of them in operation, most of which are busy in the Atlantic and the Mediterranean, bringing back the wounded from France, Italy and Africa. The great majority of their passengers have been disembarked at the Charleston, S. C., Port of Embarkation.

In a letter signed by 4 patients, the men stated "Our quarters have been to us the essence of luxury embracing all those essentials to complete comfort we had been looking forward to renewing our acquaintance with. All the members of the Medical Corps, doctors, nurses and wardmen have unstintingly and cheerfully done their utmost to make us happy, comfortable, and to speed our recovery. Never shall we forget for a moment our great indebtedness to them all."

These "floating hospitals" can anchor off an invasion coast and take care of any need of a wounded man. Completely equipped with the latest medical and surgical devices and staffed with picked medical personnel, the wards aboard these vessels compare favorably with any. Drill in abandoning ship has been given until each member of the staff knows how to evacuate patients quickly and efficiently. In accordance with international agreements, hospital ships are painted white with a wide green band around the middle and marked with huge red crosses.

APPOINTED ASSISTANT SURGEON FOR THE NATIONWIDE ARMY AIR FORCES TRAINING COMMAND

Col. W. H. Powell Jr., formerly of Fayetteville, N. C., has been appointed assistant surgeon for the nationwide Army Air Forces Training Command. He previously served as chief of the Professional Service section of the Training Command Surgeon's office. Dr. Powell will assist in the direction of medical, surgical and related functions at AAF flying and technical schools in every corner of the nation. He entered the army as a 1st lieutenant at Fort Bragg, North Carolina, in December 1929, where he was accepted for appointment to the regular army. He graduated from the Medical College of Virginia, Richmond, in 1927. He is also a graduate of the Army Medical School, Washington, D. C., of the Medical Field Service School, Carlisle Barracks, Pa., of the radiology course at the Army and Navy General Hospital, Hot Springs, Ark., and of the School of Aviation Medicine, Randolph Field, Texas.

GEN. DWIGHT D. EISENHOWER PAYS TRIBUTE TO ARMY NURSES

A tribute to the work Army nurses are doing in the European theater was recently expressed by Gen. Dwight D. Eisenhower in a letter to Mr. Edwin B. Wilson, editor of the *Brooklyn Eagle*. General Eisenhower had been informed by Mr. Wilson of the campaign being undertaken by the *Brooklyn Eagle* and by the Brooklyn chapter of the Red Cross to recruit nurses for the armed forces. Expressing his appreciation of the nurses' work, General Eisenhower wrote "Nothing stops them in their determination to see that our troops receive

the best attention humanly possible. . . . We need nurses, more nurses. The work that you and your group—and other similar groups throughout the United States—are doing must be successful."

HOSPITAL STAFFED BY GERMAN DOCTORS OPENED IN OKLAHOMA

The Army Medical Department has established a separate prisoner of war hospital staffed with doctors and medical corps men of the prisoner's nationality. The first hospital, Glennan General Hospital, with a bed capacity of 1,700, has been established at Okmulgee, Okla., for German war prisoners. American Army doctors are the chiefs of the medical services. Eight German physicians have been assigned to medical work. It is anticipated that the number will be increased to 30 or 40.

The Medical Department's new policy is in accord with the Geneva Convention Treaty, which stipulated that "it shall be lawful for belligerents reciprocally to authorize, by means of private arrangements, the retention in camps of physicians and attendants to care for prisoners of their own country."

PHYSICAL THERAPY CLINIC IN THE JUNGLE

A physical therapy clinic was created recently out of makeshift materials by members of a hospital unit on the Ledo Road, the highway which Allied troops are building from Assam, India, through Burma to China against the vigorous opposition of the Japanese. Lieut. Col. Willis M. Weeden of Woodbury, Conn., chief of surgery in the unit, assigned Capt. Hyman D. Stein of Elkins Park, Pa., and 2d Lieut. Pauline Moudy, Army Nurse Corps, of Alhambra, Calif., to the task. They made a dry heat apparatus out of a crate and electric bulbs. Stirrups with ropes and weights made weight lifting devices, a Chinese officer provided a bicycle for leg exercises, and old gasoline tanks were turned into whirlpool leg and arm baths. A water heater was created from a gasoline drum, and the hard rubber core of an old soft ball was used for hand and finger exercises.

ELECTRICALLY HEATED FLYING SUITS DELIVERED TO ARMY AIR FORCES

The General Electric Company recently delivered to the Army Air Forces the 200,000th electrically heated flying suit. The suit consists of jacket, trousers, gloves, boots and other electrically heated accessories. Each product has been subjected to a great variety of tests. Proof of the suit's ability to withstand the low temperatures encountered by airmen at high altitude has come in actual combat. Without the protection these suits afford, airmen fall easy prey to their invisible enemy frostbite. Major H. G. Thole of the AAF matériel command accepted the suit on behalf of the Air Forces from D. C. Spooner, manager of the pioneer products section of the General Electric Company, which developed the outfit.

SCOPE OF WORK AT MOORE GENERAL HOSPITAL

The Office of the Surgeon General of the Army, clarifying a recent announcement of the designation of the Moore General Hospital, Swannanoa, North Carolina, as a medical center for the study and treatment of tropical diseases, points out that the

commanding officer of the hospital is Col. Frank W. Wilson and that the chief of the medical service is Lieut. Col. Joseph M. Hayman, under whose professional direction the tropical disease center will operate. The center will not confine its attention to malaria.

CHARLES A. STAFFORD (EX SIBONEY) DESIGNATED AS U. S. ARMY HOSPITAL SHIP

The War Department announced on August 1 that on May 20 the *Charles A. Stafford* (ex *Siboney*) was designated as a United States Army hospital ship, in accordance with international practice, as set forth in the provisions of the Hague Convention X of 1907. In the future the United States Army hospital ship *Charles A. Stafford* will be operated in accordance with the provisions of applicable treaties. Notification of this designation was delivered, through channels, to the German, Japanese and Thai governments on June 3, to the Rumanian and Bulgarian governments on June 6 and to the Hungarian government on June 9. The ship's master of this and all other United States military hospital ships will at all times maintain sufficient copies of this general order for presentation to any authorized agent of an enemy belligerent who may require it for inspection.

MAJOR MANTZ APPOINTED CHIEF OF MALARIA CONTROL SECTION

Major Francis A. Mantz of Bala-Cynwyd, Pa., has been appointed chief of the Malaria Control Section in the Preventive Medicine Service, Office of the Surgeon General. Dr. Mantz has been stationed overseas as malariologist for the past three years, lastly in the China-Burma-India theater, to which he was assigned early in January 1943. Dr. Mantz graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1938 and entered the service July 1, 1941.

LIEUT. ARTHUR L. BENISON A PRISONER OF WAR

Word has recently been received by the parents of Lieut. Arthur L. Benison, formerly of Flint, Mich., that he has been held prisoner by the Japanese at Philippine Military Prison Camp No. 1 for more than two years. He was believed to be taken prisoner at Bataan. Dr. Benison graduated from the University of Michigan Medical School, Ann Arbor, in 1937 and entered the service May 15, 1941.

ARMY AWARDS AND COMMENDATIONS

Captain Harry J. Stone

The Distinguished Service Cross was recently awarded to Capt. Harry J. Stone for "extraordinary heroism in action near Anzio, Italy." The citation accompanying the award read:

"On Jan. 27, 1944 Captain Stone advanced with a company attacking in daylight across an exposed field. During the advance the enemy laid down heavy concentrations of artillery and machine gun fire on the unit. Carrying full equipment, Captain Stone kept pace with the foremost elements and, following the assault, maintained an aid station under direct enemy observation.

"Captain Stone's prompt treatment under fire was a vital necessity, since evacuation was impossible because of direct enemy observation and nearness of enemy positions.

"Four days later his battalion occupied a defensive position and was subjected to heavy and sustained enemy attack. Because of enemy observation and fire, the position could be approached only at night. Despite heavy enemy fire, Captain Stone made nightly trips to the position to evacuate the wounded. On the night of March 15-16, 1944 Captain Stone participated in an advance on two enemy strong points. Following the assault platoon under intense artillery and machine gun fire, he treated 2 casualties directly in the rear of the objectives. Leav-

ing his place of cover, he then proceeded under continued heavy fire to treat 2 more men in an open field swept by machine gun fire. Despite the intensity of artillery and small arms fire, he carried to safety 1 of the men who was unable to walk. Still under fire, he went to the aid of 5 other casualties. During the following hours of continuous combat, Captain Stone was ever available to render aid where needed. With no regard for his own safety, he promptly treated and evacuated all casualties.

"His calm demeanor and sustained courage and skill under fire were an inspiration to all officers and men, and his performance reflects the finest traditions of the Medical Corps."

Dr. Stone graduated from Wayne University College of Medicine, Detroit, in 1938 and entered the service Aug. 1, 1942.

Major Ernest Lloyd Boylen

The Bronze Star has been awarded to Major Ernest Lloyd Boylen, formerly of Portland, Ore., for meritorious service in direct support of combat operations in Italy last December and January. He commanded, within a few miles of actual combat, a field hospital unit which, according to the citation, "admitted numerous patients too seriously wounded to permit evacuation to the rear. Major Boylen so organized the hospital as to provide the highest type of surgical and medical treatment to these patients. He displayed outstanding executive ability and resolved numerous problems of administrative and supply work incident to this function. His efficiency and devotion to duty contributed greatly to the high rate of recovery of seriously wounded patients during this period." Besides the Bronze Star awarded Dr. Boylen, his unit received a Fifth Army Plaque and clasp "for outstanding performance during January 1944." Dr. Boylen graduated from Harvard Medical School, Boston, in 1926 and entered the service Aug. 8, 1942.

Captain Lucien M. Strawn

The Silver Star Award for gallantry in action has recently been presented to Capt. Lucien M. Strawn, a battalion surgeon serving with the infantry in France. The citation accompanying the award said "Capt. Strawn's battalion was engaged in a bitter fight against a powerful enemy force. Observing many wounded and knowing their immediate need for medical attention, Capt. Strawn went forward into the heavy fire to administer first aid, with complete disregard for his own personal safety. His action saved many lives, and in performing it he displayed outstanding courage and devotion to duty. Capt. Strawn's decision to go forward through terrific enemy fire and help his fellow soldiers is in keeping with the highest soldierly and professional traditions." Dr. Strawn graduated from Temple University School of Medicine, Philadelphia, in 1940 and entered the service Aug. 18, 1942.

Colonel Emory H. Gist

Col. Emory H. Gist, camp surgeon and commanding officer, Regional Army Service Forces Hospital, was awarded the Camp Lee Certificate of Commendation for "exceptionally meritorious service" by Brig. Gen. George A. Horkan, camp commander. The citation states that Colonel Gist "supervised the growth and the extensive expansion of the station hospital, and, to a large extent, its present status as an Army Services Forces Regional Hospital is a tribute to his outstanding administration." The Certificate of Commendation adds that "through his guidance an enviable high standard of health has been maintained on this post; rigid sanitation and the control of diseases and injuries have been factors in this success." Dr. Gist graduated from Barnes Medical College, St. Louis, in 1911 and has been a regular army officer since 1922.

Captain Charles A. Speer

Capt. Charles A. Speer, formerly of Somerville, N. J., has been awarded the Silver Star for gallantry in action in France on D day, June 6. He has also been awarded the Purple Heart. Dr. Speer has been serving overseas with the Army Medical Corps since October 1942. He has received battle stars for three major engagements besides the invasion of Normandy, having seen action previously in Tunisia, Bizerte and Sicily. Dr. Speer graduated from New York University College of Medicine, New York, in 1940 and entered the service June 2, 1942.

MISCELLANEOUS

DOCTOR'S MISSING BOOK FOUND WITH DEAD JAP

When Dr. Edwin Lee of Downey, Calif., was a student at Loma Linda Medical College an instructor told the students to buy Kellogg's Surgical Approaches to Anatomy. Dr. Lee bought his volume and put his name on the fly leaf. One day it vanished from his book shelf. He sought it in vain and finally bought another. The other day he received the book from a former classmate, Major L. Lawrence Whitaker, medical officer with the American forces that took Attu. The major and another Loma Linda classmate had discovered it in a Japanese hospital on the island, following the occupation by the Americans. A letter from Major Whitaker told Dr. Lee of the weird incident of finding the book. After the Americans had completed the bitter job of wiping the tenacious Japs out of Attu, Major Whitaker and a group of officers examined the garrisons where the Jap command had its headquarters. When they entered the underground hospital they found that 18 of the Jap wounded had been killed by morphine. They lay on their backs, their hands folded across their chests, stiff in cold death. The doctor who had killed his patients lay sprawled on the floor—he had put a bullet through his head. Major Whitaker and his classmate recognized the doctor as their former classmate Paul Tatsuguchi, who had been in college with them for four years. He had received his medical degree with them and had taken the California state medical examination with them when they did.

The two officers found his personal effects and, in going through them, discovered a diary which he kept in English during the last sixteen days, when the Japs realized that resistance would prove useless. He related what was happening as the battle of Attu began depleting the Jap garrison and wounded soldiers were being brought to the hospital. He methodically set down the number of patients he was treating and what he was doing for each one. He told how he had contracted diarrhea and how ill he was. On the last day, when the Japs knew that the end had come, he described how he had killed each of his patients. He wrote a farewell note to his wife and two children who lived in Japan. In final rite he wrote a rededication of himself to his emperor, setting down a renewal of his oath and then, according to the grim evidence, took his life.

In addition to the diary, one of the Loma Linda classmates picked up a volume that had a familiar appearance; it was "Surgical Approaches to Anatomy," a book that recalled many memories. The two officers examined it, and there on the fly leaf they found the name of Ed Lee. It had been crossed out and beneath it was written that of Paul Tatsuguchi.

U. S. HOSPITALS ASSURED ENOUGH SUPPLIES AND EQUIPMENT FOR TREATMENT OF POLIOMYELITIS

The War Production Board's Office of Civilian Requirements recently announced that hospitals of the United States have been assured enough supplies and equipment to treat every one of the approximately 9,500 cases of poliomyelitis reported in the current epidemic and two and one-half times that number if they should develop. Warned in June by the rapid development of the epidemic in North Carolina and Kentucky and the occurrence of 480 cases nationally, the OCR Chemicals, Drugs and Health Supplies Division officials contacted the National Institute of Health and the National Foundation for Infantile Paralysis to determine what equipment would be needed and what was available. It was revealed that 150,000 yards of wool, 500,000 yards of muslin binder, 150,000 yards of oil silk, 100,000 blankets and 25,000 dozen safety pins would be needed, together with hot pack units. Three days later the first hot pack unit thus made available was shipped by the maker to a hospital in Washington, D. C. Three more were sent to North Carolina, 15 went to Buffalo, and other orders were being filled.

Throughout the summer OCR acted as a clearing house, putting hospitals in touch with sources of equipment and sup-

plies and manufacturers in touch with materials. Contacts were made for inquiring parties and emergency ratings issued when necessary. OCR officials believed there would be little difficulty in meeting future emergency demands. Cooler weather is expected to help stop the spread of the disease.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, September 16, page 177)

ILLINOIS

Illinois Central Hospital, Chicago. Capacity, 290; admissions, 5,378. Dr. W. W. Leake, Chief Surgeon (interns, resident).

NEW YORK

Ellis Hospital, Schenectady. Capacity, 470; admissions, 14,385. Miss Mary G. McPherson, R.N., Administrator (intern, October 1).

PENNSYLVANIA

Babies Hospital, Philadelphia. Capacity, 14; admissions, 235. Dr. Laura E. McClure, Medical Director (resident—pediatrics, October 1).

WISCONSIN

State of Wisconsin General Hospital, Madison. Capacity, 772; admissions, 13,393. Dr. H. M. Coon, Superintendent (resident—surgery).

U. S. DOCTORS SAVE TWO HUNDRED JAVANESE

The lives of more than 200 Javanese workers were recently saved after being treated by American doctors when General MacArthur's men invaded Numfoor Island, a Japanese held air base at the entrance of Geelvink Bay, off the northwest coast of Netherlands New Guinea on July 2. Hundreds of Indonesians had been transported there from other Netherlands East Indies Islands to work on defense projects. Some were on the verge of death as a result of starvation, overwork and disease. Medical personnel of American hospital ships were immediately assigned to treat these workers, a number of whom were in such critical condition that they needed blood transfusions. Most of the victims of Japanese cruelty pulled through, but some were beyond help and died en route to Australia.

WOMEN GIVEN BRAVERY AWARDS

The Office of War Information recently announced that awards from the Army and Navy for bravery and efficiency in war have been presented to 105 American women. Army nurses lead with 97 and a Distinguished Flying Cross, the highest award ever given an American woman in uniform. This was presented to Lieut. Kathleen R. Dial of Florence, Ala., in recognition of her work in taking care of 18 patients after a flying ambulance crashed off Port Moresby, New Guinea.

Flying nurses have received 29 air medals, 11 with four oak leaf clusters, for flights in combat areas. Twenty-four Purple Hearts have been received by Army nurses and four by Wacs. The Soldier's Medal for personal bravery has been presented to four Army nurses and two Wacs.

HEALTH NEWS FROM EUROPE

The Netherlands Information Bureau recently stated that diphtheria has increased thirtyfold in occupied Holland, with a weekly average of 1,800 new cases reported for the country. According to information gathered by medical personnel of the Nazi government, deaths resulting from diphtheria totaled 2,382 in 1943, as compared with the 75 reported in 1939 prior to the Nazi occupation. The tuberculosis toll has doubled within this period, the reports also revealed. In 1939 the number of deaths due to this disease was 3,595, while in 1943 it rose to 6,382.

ORGANIZATION SECTION

POSTWAR MEDICAL SERVICE

A meeting of the Committee on Postwar Medical Service was held on September 9 at the Waldorf Astoria Hotel in New York City. The following members and guests were present: Dr. Roger I. Lee, chairman, Dr. Irvin Abell, Dr. Francis G. Blake, Dr. F. F. Borzell, Dr. Frederick A. Collier, Mr. Graham E. Davis, Dr. Morris Fishbein, Dr. Alan Gregg, Dr. Charles M. Griffith, Mr. B. A. Horning, Dr. E. E. Irons, Dr. Victor Johnson, Mr. E. R. Loveland, Lieut. Col. Harold C. Lueth, Dr. W. W. Palmer, Col. George M. Powell, Dr. W. C. Rappleye, Father Alfonse Schwitalla, Miss Mary Switzer, Dr. Olin West and Dr. Ralph C. Williams.

The chairman reported the loss of a valued member of the committee, Dr. William C. Breed of Boston, who died in August, and stated that the vacancy thus caused would be filled by the appointment of Dr. Morris Piersol of Philadelphia.

REPORT ON QUESTIONNAIRE

An interim report on the questionnaire returns was presented by Lieutenant Colonel Lueth. It is expected that during September and October an adequately representative number of returns will be received, and a full report can be presented at the next meeting of the committee on October 28. The returns thus far received indicate that the first sampling of 1,000 presents a characteristic picture and thus has served well the purpose of a specimen or trial sampling.

REPORT ON EDUCATIONAL FACILITIES

Dr. Victor Johnson presented the material of a report on educational facilities required for returning medical officers, which he has prepared with Dr. F. H. Arestad. After considerable discussion of the statistics and comment offered by Dr. Johnson, it was voted that the chairman be authorized to appoint a committee to confer with the Surgeons General regarding places for study in the hospitals of the Army, Navy and civilian hospitals. The chairman designated Dr. Palmer, Dr. Johnson, Lieutenant Colonel Lueth and Father Schwitalla and, as chairman, Dr. Frederick A. Collier.

PROVISIONS FOR LICENSURE OF RETURNING OFFICERS

There appeared before the committee Dr. Barton of the Procurement and Assignment Service, Mr. Wheaton of the War Man Power Commission, Mr. Robinson of the Council of State Agencies and Mrs. Gallaher of the Department of Justice to solicit opinion on a proposal relating to the amendment of the medical practices acts of the states by adding the following:

"If an applicant presents evidence satisfactory to the board that he (1) has been graduated by a medical school reputable and in good standing as determined by the board, has been licensed by a state of the United States, (2) has served in the active military or naval service on or after Sept. 16, 1940 and prior to the termination of the present war as a commissioned medical officer of the Army or Navy and has been discharged or released therefrom under conditions other than dishonorable or has rendered medical service during the period 1940 to 1945 in industry or in a civilian community and (3) is of good moral character, the board in its discretion may issue him a temporary license for a period of time to be fixed in the license issued to practice medicine in this state without requiring that he pass any examination (including a basic science examination if that is a condition precedent to licensure) that otherwise he would be required to pass. An application for such a license shall be on a form approved by the board and shall be accompanied by such fee as is required for other licenses issued without examination."

This amendment is to become effective at once and is to remain in effect until the governor, on the recommendation of the state board of medical licensure, proclaims that this amendment is no longer necessary.

After discussion, the following resolutions were passed unanimously by the committee:

1. That the Committee on Postwar Planning announces its approval of the proposed legislation;

2. That the committee recommends that the Council of State Governments be requested to give active support to the proposed legislation in the various states;

3. That the committee recommends to state medical associations that they support such legislation and that such associations obtain the assistance of the Procurement and Assignment Service of the War Manpower Commission through its state representatives, and

4. That the committee recommends to state medical associations that they appoint liaison officers to correlate the efforts of those supporting this legislation.

ASSISTANCE TO MEN DISCHARGED FROM SERVICE

The chairman then asked Dr. Charles M. Griffith of the Veterans Administration to comment on public law 346, 78th Congress, relating to the provision of educational assistance to men after discharge from military service, since the interpretations and application of this law will be for the Veterans Administration to make. It was voted that the chairman appoint a subcommittee to confer and cooperate with the Veterans Administration, and for this purpose the chairman designated Dr. Collier, Dr. Palmer and Father Schwitalla.

RECOMMENDATIONS ON SURPLUS SUPPLIES

Dr. Palmer reported that a committee of the National Research Council appointed to advise the War Production Board on the subject of essential drugs and supplies had prepared a series of recommendations which cover the measures to be taken in control of the disposal of surplus drugs, materials and supplies after the war. Dr. Palmer stated that the report is now in the committee stage of discussion by Congress but that it would be appropriate for some formulation of opinion to be expressed at this time.

It was voted that the recommendations in the report of this National Research Council committee be approved.

ORGANIZATION OF INFORMATION BUREAU

Dr. West reported that arrangements are being made for the organization of the Information Bureau at American Medical Association Headquarters as authorized by the Trustees of the American Medical Association.

WARTIME GRADUATE MEETINGS

In the absence of Commander Bortz, Dr. Borzell gave an account of the work of the Committee on Wartime Graduate Medical Meetings and requested an expression regarding its continuance after the cessation of hostilities, especially in the European theater of war. It was voted that the committee express its appreciation of the valuable work done under the direction of Commander Bortz and that a further report be requested at the next meeting of the committee.

October 28 was agreed on as being the time for the next meeting of the committee and the place Chicago.

ANNUAL CONFERENCE OF STATE SECRETARIES AND EDITORS

The Annual Conference of Secretaries of Constituent State Medical Associations and Editors of State Medical Journals will be held in Chicago at the offices of the American Medical Association on Friday and Saturday, November 17 and 18. Two sessions of the conference will be held on Friday, November 17, the first at 10 a. m. and the second on the afternoon of that day. On the evening of November 17 a program given over to the discussion of topics of particular interest to editors of the journals of constituent state medical associations will be presented at the Palmer House. The concluding session of the conference will be held at the offices of the Association on the morning of Saturday, November 18.

While these annual conferences have each year been attended by nearly all of the secretaries of constituent state medical associations and editors of medical journals of those associations, there has been a constantly increasing attendance of other officers of constituent state medical associations and officers of component county and district medical societies, and of late

years a very considerable number of members who do not occupy official positions have been present. The members of all those groups will be cordially welcome at the November conference.

All who expect to attend the conference this year are especially urged at the earliest possible time to make necessary arrangements for hotel accommodations and railroad transportation.

WASHINGTON OFFICE BEGINS ACTIVITY

On September 1 the Washington office of the Council on Medical Service of the American Medical Association began its activities. The office is located at 1835 I Street N.W. Dr. Joseph S. Lawrence, formerly representing the Medical Society of the State of New York in Albany, is in charge of this office. Any requests for assistance in relation to material available in Washington may be addressed directly to Dr. Lawrence. The activities of the office will be reported from time to time in THE JOURNAL.

AIR CONDITIONING

The Association's Committee to Study Air Conditioning maintains a compilation of pertinent bibliographic material with brief abstracts related to air conditioning for human comfort and health but not for industrial materials and products.

While this committee cannot undertake to furnish complete bibliographic material, it will furnish, without cost, to physicians and other professional personnel citations with minor abstracts on any one or any small number of the categories mentioned. This committee does not agree to pass on the merits of any air conditioning installation, nor can it furnish detailed plans for desired air conditioning in any operation. The material available is limited solely to citations to the world's literature on air conditioning in relation to human beings such as is available to the committee for review. Abstracting for the years 1942-1943 has just been completed.

The members of the Committee to Study Air Conditioning are Alvan L. Barach, Walter M. Simpson, C. P. Yaglou and Carey P. McCord, Chairman. Requests should be addressed to Carey P. McCord, M.D., 10 Peterboro Street, Detroit 1, Michigan.

This material is segregated in the following categories:

Air Analysis.	Hospital Air Conditioning.
Air Cleaning.	Hotels.
Air Conditioning in Tropics.	Humidity, Humidifying and Dehumidification.
Aircraft.	Industrial Air Conditioning and Ventilation.
Air Flow, Air Circulation and Distribution, Air Movement.	Instruments and Apparatus, Laboratory.
Air Pressure, High.	Insulation.
Air Raid Shelters and Military Air Conditioning.	Ionization.
Allergy and Allergens.	Laws, Standards and Codes.
Altitudes, High. Low Air Pressure.	Libraries and Museums.
Apparatus Breathing.	Mines.
Bacteria.	Miscellaneous Buildings and Structures.
Banks.	Natural Infiltration.
Charts and Tables.	Newspapers.
Climate, Season and Weather.	Noise and Noise Control.
Clothing.	Odors and Odor Effects, Air Freshness, Deodorization.
Comfort and Comfort Zone.	Office Buildings.
Condensation.	Operating Rooms (Hospitals).
Cooling Agents for Air Conditioning Refrigerants, General.	Oxygen and Oxygen Therapy.
Cooling and Refrigeration. Summer Cooling.	Ozone.
Costs, Economics and Sales.	Personal Protective Equipment.
Dehydration.	Physical and Physiologic Principles, General.
Department Stores. Stores.	Pollution, Atmospheric, General.
Design.	Priorities and Rationing.
Ducts.	Progress and Future of Air Conditioning.
Dust Control.	Public Buildings.
Dust Determinations.	Railroads and Automobiles.
Education and Training.	Respiratory Diseases.
Environment and Health.	Restaurants.
Equipment.	Schools.
Fans.	Ships.
Fire Hazards.	Sterilization of Air.
Heat.	Temperature and Humidity Control.
Heat Regulation (Temperature Regulation).	Temperature Changes.
Heat Transfer.	Temperature, Effective.
Heating and Ventilation and Air Conditioning, General.	Tunnels.
Heating, Radiant.	Windowless Structures and Black-outs.
Homes and Apartment Houses.	

WASHINGTON LETTER

(From a Special Correspondent)

Sept. 18, 1944.

Hearings of Pepper Subcommittee on Wartime Health and Education

"Medical care for the people of the United States is not enough," Dr. Roger I. Lee, President-Elect of the American Medical Association and chairman of the Joint Committee on Postwar Medical Service, told the Pepper hearings on wartime health and education here. "It must be good medical care. Good medical care is based on good medical education, on medical research and on good medical communication." Dr. Lee declared that no doctor who graduated ten years ago can be a good practitioner solely on what he learned in medical school. Continuing medical education for the doctor is necessary, to be met only partly for most doctors by reading, perhaps by medical meetings, by long or short courses, or by long or short visits to medical centers and hospitals. "It is customary and accurate to state that the United States has the finest health record in the world. But that is not enough," he continued. "The practice of medicine in the United States is undergoing rapid change. We live in a changing world," Dr. Lee said. "Good roads, airplanes and other new devices will have a part in the changes in our lives and medical practice. Controlled scientific experimentation can, I think, be depended on to develop sound medical care for every one in the United States. This will require the cooperation of the government, the medical profession and the public."

On the subject of prepayment medical plans, Dr. Lee said some had been discarded as unsound, others had "folded up" as unsuccessful. While the insurance principle had a definite appeal, there were difficulties in its application. The insurance principle seemed to be working fairly but not altogether successfully in voluntary prepayment hospitalization plans. General prepayment sickness plans had similar success when the insured group was homogeneous, as in some industries or universities. General plans, he said, found great difficulties in the heterogeneous population of the country. Great Britain's national health insurance plan, so often quoted, has met great difficulties and has not resulted in furnishing medical service approaching the quality of medical care in the United States. Maintenance of the quality of medical care is fundamental in any health program, he said, declaring it was hard to improve the phraseology of a British recommendation: "There should be initiated, by arrangement and agreement between the government and the profession, organized experiments in the methods of practice, such a group practice, including health centers of different kinds, which should extend to general practitioners hospital units attached to general hospitals. Future developments in group practice should depend on the results of such clinical and administrative experimentation."

Dr. Lee elaborated on the report that 4,000,000 men had been rejected as physically disqualified for the armed forces. Standards of physical fitness had varied as the needs for manpower varied. The examinations were carried out by 33,000 physicians and 10,000 dentists who had served without remuneration. Some of the doctors boasted that they were "tough" and their personal interpretation of the standards had been tough, in the belief that all men should be fit for overseas combat service. Other examining doctors were lenient, and some soldiers they had passed were found unfit for training and were discharged. Rejections had been made for mental disease, mental deficiency, illiteracy and neurologic disorders. Dr. Lee felt that many in other categories could be made to meet standards and needs of the armed forces.

Dr. Lee said that to ascertain postwar plans of medical officers a questionnaire had been circulated with enthusiastic consent of the Surgeons General of the Army, Navy and Public Health Service. The Joint Committee was amazed at the large response and uniformity of answers to the questionnaire. Younger officers largely wanted to finish or supplement their training, older men wanted to get back to their practices, although some wanted short refresher courses. The Joint Committee, Dr. Lee said, was greatly concerned in the problem of disposal of surplus war supplies as they concern medical and hospital supplies.

Many returning medical officers will find their medical equipment obsolete or dissipated. Hospitals, having yielded to needs of the armed forces, require x-ray machines, surgical instruments, rubber gloves, and other supplies.

First witnesses at the resumed sessions of the Pepper Subcommittee on Wartime Health and Education were Dr. R. L. Sensenich of the Board of Trustees, American Medical Association, Dr. Harvey Stone, member of the Council on Medical Education and Hospitals, and Dr. Lee. Dr. Stone further elaborated on the reason for rejection of a large number of draftees by the various examining bodies functioning under the Selective Service law. The rejections had attracted wide attention and led to inferences and deductions that general public health was in a deplorable state. "I believe that a careful appraisal of the facts do not warrant the drawing of such conclusions," he said. Dr. Stone said that, despite the withdrawal of about 55,000 doctors into the federal services through the war, a general breakdown of civilian medical care had not resulted. "This remarkably good record shows that, despite shortages in trained personnel, the public health services, such as the protection of the food and water supply, the maintenance of sanitary conditions, control of infectious diseases and, more particularly, the care of the sick, are still operating efficiently," he said. Dr. Stone recommended a change in the attitude of Selective Service to assure a continuous supply of medical school graduates. He also saw benefits accruing from a well thought out and soundly organized program for hospital and laboratory facilities in areas now inadequately supplied.

Hearing on the Physically Handicapped

American Medical Association statistics on the number of hard of hearing persons in the United States were submitted to the Kelley hearing on the Physically Handicapped here this week. Alan B. Crammatte of the American Federation of Physically Handicapped, Inc., quoted the figures showing an overall total of some 5,500,000 deaf persons, with about 3,000,000 children affected in some degree and between 60,000 and 100,000 totally deaf. Mr. Crammatte was one of several witnesses who charged that educational facilities for deaf and hard of hearing children in the country are wholly inadequate both in teaching personnel and in equipment.

The American Medical Association was to have been represented at the hearings by Dr. Walter Hughson, director of the Abington (Pa.) Memorial Hospital, but Dr. Hughson was taken seriously ill in Washington and was unable to attend

the sessions. Two medical witnesses were Dr. Harry Best of the University of Kentucky, Lexington; author of books on the subject, and Dr. Robert West, professor of speech pathology, University of Wisconsin, Madison. While Dr. Best's testimony did not touch to a great extent on the medical aspects of the question, he expressed pleasure that the federal government was taking an interest in the welfare of the deaf. Employers generally were unaware of what the deaf can do. He advocated more publicity and proposed that each state have a person to advise the deaf and employers alike, to their mutual advantage. Dr. Best expressed the opinion that there are 5 deaf per 10,000 in the country on the basis of census reports. He said that 60 per cent of the afflicted are congenitally deaf, 27 per cent are deaf before 3 years of age and 13 per cent later. Deafness, he indicated, was a problem both of childhood and of old age. He reported Wisconsin plans to set up centers in the state where the hearing loss of each individual will be estimated and help will be given in selecting a hearing aid.

Criticism of the federal government employment policies in regard to deaf and hard of hearing elicited an official statement from the Civil Service Commission that it had surveyed 3,500 types of jobs and found that 1,200 of them could be handled by totally deaf persons and 3,200 by hard of hearing. The commission reported that since October 1942 the government had hired 3,000 hard of hearing and 1,500 totally deaf persons.

Among witnesses at the hearings for the deaf were Miss Elizabeth Withers, American Occupational Therapy Association, Washington; Edmond Boatner, American School for the Deaf, West Hartford, Conn.; Ben M. Showe, National Association of the Deaf; Raymond H. Greenman, managing director, American Society for the Hard of Hearing; Miss Josephine Timberlake, executive secretary, Volta Bureau; Paul A. Strachan, president, American Federation of the Physically Handicapped, and Rev. Herbert C. Merrill, president, Gallaudet College Alumni Association.

Representative Augustine B. Kelley (Democrat, Pennsylvania) reported that further hearings of his committee on the physically handicapped will be held in New York on October 2-4, in Pittsburgh on October 17 and 18 and in Detroit on October 19 and 20. Mr. Kelley has expressed to Dr. Olin West, Secretary of the American Medical Association, his gratitude for cooperation rendered in the hearings by the American Medical Association and for publicity in *THE JOURNAL*, which he said had resulted in valuable material being sent directly to the committee.

MEDICAL ECONOMIC ABSTRACTS

ANOTHER COMPULSORY SICKNESS INSURANCE PLAN

The Subcommittee on Medical Care of the Committee on Administrative Practice of the American Public Health Association has submitted a "preliminary report" on the national program for medical care. This report appears in the September 1944 issue of the *American Journal of Public Health* (p. 984). The program suggested follows closely the recommendations of the International Labor Organization on Sickness Insurance already described in *THE JOURNAL*.¹

The similarity is shown in the following selection from the preliminary report of the Subcommittee on Medical Care:

A national program for medical care should make available to the entire population, regardless of the financial means of the individual, curative services.

Services should be adequately and securely financed through social insurance supplemented by general taxation, or by general taxation alone.

The public health agencies—federal, state and local—should carry major responsibilities in administering the health services of the future.

The agency authorized to administer such a program should have the advice and counsel of a body representing the professions, other sources of service and the recipients of services.

There is more of a similarity to the Wagner-Murray-Dingell bill than is found in the original recommendations of the International Labor Office in that the public health department is

proposed as the administrative agency and that the role of the medical profession is reduced to representation in an advisory commission.

The members of the subcommittee submitting the report are Joseph W. Mountin, M.D., chairman, Earle G. Brown, M.D., David D. Carr, M.D., Edwin F. Daily, M.D., Graham Davis, I. S. Falk, Ph.D., J. Roy Hege, M.D., Hugh R. Leavell, M.D., Emory Morris, D.D.S., George St. J. Perrott, Marion G. Randall, R.N., Edward S. Rogers, M.D., and Nathan Sinal, D.P.H.

PROGRESS OF MEDICAL SERVICE PLANS

Medical-Surgical Plan of New Jersey.—The first contracts were issued in July 1942. It serves the state of New Jersey and offers both medical and surgical contracts. On Dec. 31, 1943 it had a total membership of 7,334 males and 8,681 females, including both subscribers and dependents. During 1943 it had an income from subscribers of \$74,498.47, expended \$67,348.46 and accumulated a surplus of \$12,201.35.

California Physicians' Service.—This was organized in 1939 and serves the state of California. On March 31, 1944 it had contracts covering 38,990 males and 53,010 females, making a total of 92,000. Its income to the date mentioned was \$1,280,054.03; disbursements amounted to \$1,206,401.39, leaving a net gain of \$73,652.64. It now has a stabilization fund of \$90,165.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Personal.—Dr. Frank M. Hall has resigned as director of the Limestone County Health Unit in Athens to organize a similar unit in Gainesville, Fla., it is reported.

Condemnation Proceedings Started for Medical School Site.—Condemnation proceedings have been started on four square blocks between Sixth and Eighth avenues, south, and Eighteenth and Twentieth streets, Birmingham, to provide a site for the new University of Alabama School of Medicine (THE JOURNAL, March 4, p. 658, and April 22, p. 1212). Plans are under consideration to merge Hillman and Jefferson hospitals under the Jefferson Hospital roof, which would leave Hillman Hospital vacant. Tentative plans include using the vacant building as temporary administrative offices for the four year medical school.

CALIFORNIA

Fund for Tropical Medicine.—The Columbia Foundation of San Francisco has given \$13,800 to assist in the establishment of a department of tropical medicine at the University of California Medical School, San Francisco, it is reported.

Tuberculosis Control in the State Hospitals.—The state department of public health is cooperating with the state department of institutions in a program of tuberculosis case finding in state hospitals. A mobile x-ray unit will be used in the project. X-ray examinations have already been completed of most of the patients in Patton State Hospital, Patton. A similar program will be undertaken in the Folsom State Prison, which, according to *California's Health*, will be the first tuberculosis x-ray survey of a California state prison.

Medicine to Benefit in Appropriations for Postwar Planning.—More than \$27,000,000 will be expended by the University of California in a building program to be undertaken after the war. The legislature has already appropriated several million dollars for the work, which includes new buildings and expansion programs for medical and public health projects. At Los Angeles the proposed projects will include the student health center, \$450,000; student hospital, \$600,000, life sciences, \$1,000,000. In San Francisco more than \$6,000,000 will be spent, \$4,000,000 to finance a teaching hospital, \$1,000,000 for medical science, \$500,000 for a nurses' home, \$200,000 for interns' quarters and \$100,000 for a dental clinic.

DISTRICT OF COLUMBIA

Annual Scientific Assembly.—The Medical Society of the District of Columbia will hold its annual scientific assembly at the Mayflower Hotel, Washington, October 5-7, under the presidency of Dr. Fred R. Sanderson. The program is presented as a preview of postwar medicine and includes the following speakers:

Dr. Robert H. Williams, Boston, Thiouracil Treatment of Thyrotoxicosis.
Dr. Lothar B. Kalinowsky, New York, Electric Convulsive Therapy in Psychoneuroses.
Lieut. Howard M. Odell (MC), The Future of Our Coronaries.
Louis L. Williams Jr., medical director, U. S. Public Health Service, The Malaria Problem.
Dr. Howard F. Root, Boston, Diabetes Tomorrow.
Dr. Frank H. Lahey, Boston, Biliary Tract Surgery.
Lieuts. C. Hunter Sheldon and Robert H. Pudenz (MC) and Lieut. Comdr. Joseph S. Restarski (DC), Direct Observation of the Brain Under Physiologic Conditions.
Dr. George P. Muller, Philadelphia, Regional Ileitis.
Dr. James Ross Veal, Management of Venous Thrombosis.
Comdr. George W. Christiansen (DC), Oral and Plastic Surgery.
Brig. Gen. Fred W. Rankin, M. C., Surgery in the Forward Echelon.
Brig. John Tilden Howard and Arthur M. Skingley, Baltimore, Inflammatory Lesions of the Lower Gastrointestinal Tract.
Dr. Frank E. Adair, New York, Cancer of the Breast.
Lieut. Comdr. Francis S. Cheever (MC), The Dysenterias.
Lieut. Comdr. Kirby, Surgeon General of the Army, Present Concepts of Military Surgery as Developed in the European Theater.
Dr. Frank W. Konzelmann, Philadelphia, Recent Advances in Laboratory Diagnosis.
Dr. Norman M. Scott, Trenton, N. J., Experiments in Medical Care.
Dr. Norman T. Brooke, M. C., Rehabilitation of Veterans.
Major Charles R. Rowntree, M. C., The National Program for Physical Fitness.
Major Henry B. Gwynn, M. C., Reconditioning in Civilian Hospitals.
Dr. Geza de Takats, Chicago, The Causal State in Peace and War.

Luncheon sessions during the meeting will be addressed by Commodore Arthur W. Clarke of the Royal Navy, who will speak on "Maintaining Morale in Fighting Men at Sea"; Major Gen. David N. W. Grant, the Air Surgeon, "Aviation Preventive Medicine," and William Mather Lewis, LL.D., president of Lafayette College, Easton, Pa. One feature will include a panel discussion on chemotherapeutic drugs with the following speakers: Dr. Chester S. Keefer, Boston, moderator; Lieut. Col. Michael E. DeBakey, M. C., Lieut. Comdr. Adolph M. Hutter (MC) and Lieut. Comdr. Edwin E. Barksdale (MC). There will be a panel discussion Saturday morning on the future of medicine with the following speakers: Dr. John P. Peters, New Haven, Conn.; Dr. Walter H. Judd, congressman from Minnesota; Ross T. McIntire, Surgeon General of the Navy; Claude D. Pepper, Senator from Florida; Thomas Parran, Surgeon General of the Public Health Service, and Dr. John H. Fitzgibbon, Portland, Ore.

INDIANA

Fellowship in Cancer.—Establishment at the Robert W. Long Hospital of the Indiana University Medical Center, Indianapolis, of a fellowship for the training of a pathologist in specialized diagnoses and research in cancer has been announced by the Indiana Women's Field Army of the American Society for the Control of Cancer. The Women's Field Army of Marion County, assisted by the state division, will provide also during the coming year for the sponsorship of the services of Miss Millicent Duckworth, medical center research worker, in the follow-up of cancer patients in the medical center and Indianapolis City Hospital clinics.

State Medical Meeting.—The ninety-fifth annual meeting of the Indiana State Medical Association, in conjunction with the army air force medical services, will be held at the Murat Temple, Indianapolis, October 3-5, under the presidency of Dr. Jacob T. Oliphant, Farmersburg. Among the speakers will be:

Dr. Paul H. Holinger, Chicago, Bronchoscopic Diagnosis of Bronchial Tumors.
Dr. Lillian B. Mueller, The Teaching of Anesthesia.
Major Gen. David N. W. Grant, the Air Surgeon, Medical Aspects of Pressurized Aircraft.
Dr. Newell C. Gilbert, Chicago, Functional Disturbances versus Organic Heart Disease.
Dr. Chester S. Keefer, Boston, Indications and Methods of Use of Penicillin.
Dr. Virgil S. Counseller, Rochester, Minn., Indications for Radical versus Conservative Treatment for Gynecologic Conditions.
Colonel Howard A. Rusk, M. C., New Horizons in Management of Convalescents.
Brig. Gen. Fred W. Rankin, M. C., Advances in Army Medicine.
Ross T. McIntire, Surgeon General of the Navy, Medical Aspects of Naval Warfare.
Dr. A. Jerome Sparks, Fort Wayne, Upper Urinary Tract Symptoms of General Interest.
Major Randolph L. Clark Jr., M. C., The Evolution of the Treatment of Pilonidal Cysts in Sinuses.
Dr. Eugene B. Mumford, Indianapolis, Bone Grafts—Review of 193 Cases.
Dr. Leo K. Cooper, Gary, Surgery of Trauma and Its Importance as an Emergency.
Major Dillon D. Geiger, M. C., Penicillin in Otolaryngology.
Major John G. Bellows, M. C., Penicillin in Ophthalmology.
Dr. Ralph M. Waters, Madison, Wis., Artificial Respiration.
Major Donald S. Thatcher, M. C., The Correction of Protein Deficiency by Amino Acid Therapy in the Management of Surgical Patients.
Dr. Charles N. Combs, Terre Haute, The First Nitrous Oxide Anesthesia Administered by Dr. Horace Wells, Dec. 11, 1844—A Memorial.

At the annual banquet, Dr. Frank H. Lahey, Boston, will discuss "Present and Postwar Medical Economic Problems." The program also includes Michael "Mickey" MacDougall, New York, on "Card Sharks versus Soldiers and Sailors."

MICHIGAN

Physicians Honored.—The Lapeer County Medical Society gave a dinner August 29 in honor of physicians who have completed fifty or more years in the practice of medicine. Among the guests were Dr. Frank A. Tinker, Lapeer, who has served sixty years, and Drs. David H. Burley, Almont, and Henry G. Merz, Lapeer, both of whom have completed fifty years in the practice of medicine.

Changes in Health Personnel.—Dr. Louis K. Peck has been appointed health officer of Crawford, Kalkaska, Missaukee and Roscommon counties with headquarters in Lake City. —Dr. Douglas S. Fryer resigned August 11 as assistant director of the bureau of local health services, Michigan Department of Health, Lansing, to join the Wyeth Laboratories, Philadelphia. —Dr. William A. Corcoran has been appointed health officer of Ishpeming, succeeding Dr. Neal J. McCann (THE JOURNAL, August 26, p. 1199).

Postgraduate Medical Conference.—On October 13 the University of Michigan Medical School, Ann Arbor, will conduct its annual postgraduate medical conference. Among the speakers will be

Dr. Sture A. M. Johnson, Nevus of the Skin: Diagnosis and Treatment
Dr. Gordon K. Moe, Circulatory Actions of the Veratrum
Dr. Carl D. Camp, Postural Tension as a Cause of Pain
Dr. Albert C. Furstenberg, Diseases of the Salivary Glands
Dr. Cyrus C. Sturgis, Medical Treatment of Diseases of the Thyroid Gland
Dr. Frederick A. Collier, Surgical Treatment of Diseases of the Thyroid Gland
Dr. John Alexander, The Management of Benign and Malignant Interthoracic Neoplasms
Dr. Raymond W. Waggoner, Psychiatric Aspects of Chest Pain
Dr. Norman F. Miller, Toxemias of Late Pregnancy

MISSOURI

Annual Fall Clinical Conference.—The twenty-second annual fall clinical conference of the Kansas City Southwest Clinical Society will be held in Kansas City, October 24, at the Municipal Auditorium. Dr. Max Goldman, Kansas City, president of the southwest clinical society, will give the address of welcome. Among the speakers will be

Dr. Frederic E. B. Foley, St. Paul, Management of Vesical Neck Obstruction
Dr. Russell L. Haden, Cleveland, Treatment of Rheumatoid Arthritis
Dr. Robert L. Jackson, Iowa City, The Management of Acute Rheumatic Fever in Children
Dr. Frank H. Lahey, Boston, The Management of Surgical Lesions of the Terminal Ileum, Colon and Rectum
Capt. Bruce V. Leamer (MC), Aviation Medicine—A Brief Review and Its Part in the Present War
Dr. William F. Rienhoff Jr., Baltimore, Surgical Treatment of Lesions of the Biliary Tract
Dr. Earl C. Sage, Omaha, Questions Arising in the Office Practice of Obstetrics and Gynecology
Dr. Cyrus C. Sturgis, Ann Arbor, Mich., The Leukemias
Dr. Owen H. Wangenstein, Minneapolis, Studies on the Origin and Treatment of Ulcer

The guest speakers are scheduled for more than one topic for discussion. "The Newer Things in Medicine" will be considered in a round table discussion conducted by Dr. Ira H. Lockwood, Kansas City, Dr. Foley, Dr. Haden, Dr. Rienhoff, Dr. Sturgis and Dr. Wangenstein. At a joint evening session with the local county medical societies on Tuesday Dr. Lahey will discuss "Medicine Today, In and Out of the Service and After the War." The program also includes symposiums on gastroenterology, obstetrics, pediatrics, cardiovascular diseases, urogenital abnormalities and headache and backache.

NEW YORK

Commission Named to Study Care of Needy.—Dr. Basil C. MacLean, medical director of the Strong Memorial Hospital, Rochester, has been appointed head of a ten member commission requested by Governor Dewey to draft a program providing medical care for needy persons in the state, according to the Rochester *Democrat and Chronicle*, September 7. The commission, which has \$40,000 for its work, was authorized by the 1943 legislature and results of its study are intended for use in formulating legislation for submission in 1945. The commission will make necessary studies to devise programs for medical care for persons of all groups and classes in the state of New York, Governor Dewey is reported to have said in a press interview. The commission was created after Governor Dewey told the legislature in his annual message last January that medical care for persons who cannot provide it for themselves was "one of the chief areas of unmet human need." Assemblyman Lee B. Mailler, sponsor of the bill, was designated by the governor as vice chairman of the group, although he is also an ex officio member. Other members of the commission include Dr. George M. Mackenzie, Cooperstown, Dr. Heiman G. Werskotten, Syracuse, Dr. Lucien M. Brown, Rev. John J. Bingham, Dr. Robert L. Levy and Garrard B. Winston, lawyer, all of New York City, Miss Ruth Hall, R.N., Buffalo, Miss Agnes Gelnas, R.N., New York, and Miss Marion W. Sheahan, R.N., Albany.

New York City

Cancer Foundation Seeks Funds.—On September 4 the National Foundation for the Care of the Advanced Cancer Patients Inc., opened a campaign to raise \$1,800,000 to provide beds and care in established institutions at low cost for incurable cancer patients. The campaign will be carried out under the direction of the foundation's executive committee, consisting of Julius I. Perlmutter, president, Dr. Frank E. Adair, president of the American Society for the Control of Cancer, Dr. Roscoe R. Spencer, director of the National Cancer Institute, Bethesda, Md., John W. Wingate of New York University, Morris M. Bernstein, treasurer, Morton Morrison, secretary of the foundation, and Mrs. Francis J. Rigney,

commander of the Metropolitan area of the Women's Field Army of the New York City Cancer Committee. Organization of the foundation was announced in *THE JOURNAL*, May 20, page 221.

New Psychosomatic Clinic.—A psychoanalytic and psychosomatic clinic for training and research has been established in the department of psychiatry at Columbia University College of Physicians and Surgeons. The new clinic, said to be the first of its kind in the United States, is under the supervision of Dr. Nolan D. C. Lewis, executive officer of the department of psychiatry at Columbia University and director of the New York State Psychiatric Institute and Hospital. Dr. George E. Daniels, clinical professor of psychiatry, has been appointed chief of the psychosomatic service. The following additional appointments were announced: Dr. Sandor Rado, clinical professor of psychiatry, director of the clinic and chief of the psychoanalytic services for inpatients and outpatients, Dr. David M. Levy, assistant clinical professor of psychiatry and chief of the psychoanalytic service for children, Dr. Abraham Kardiner, assistant clinical professor of psychiatry and chairman of the seminar on comparative analysis of cultures. The new clinic is located at the Columbia-Presbyterian Medical Center and will be opened in October. Qualified physicians who are graduates of an approved medical school and have completed an approved hospital internship of not less than one year will be required to undergo a psychoanalysis in order to be admitted to the three year course of resident graduate training in psychoanalysis and psychosomatic medicine. The course of training includes a systematic program of lectures and seminars, clinical conferences and supervised clinical work on the psychoanalytic and psychosomatic services. It is combined with two years of resident graduate study in the other branches of psychiatry, with emphasis on the related basic medical sciences. Those who meet the requirements may register for the degree of doctor of medical science. On completion of an acceptable, original and previously unpublished dissertation on the laboratory or clinical aspects of the specialty and satisfactory completion of written, oral and practical examinations in related clinical and laboratory fields, the candidate may be recommended for the degree of doctor of medical science.

OHIO

Medical Society Observes Centennial.—The one hundredth anniversary of the Northwestern Ohio Medical Society will be held at the Elks Club, Findlay, October 3. A luncheon address will be delivered by Dr. Walter C. Alvarez, Rochester, Minn., on "Hints in the Recognition of Puzzling Abdominal Pain." Other speakers, members of the faculty of the University of Cincinnati College of Medicine, will be

Dr. Marion A. Blankenhorn, The Toxic Reactions of the Newer Sulfonamides
Dr. A. Ashley Weech, The Child Who Won't Eat
Dr. Joseph A. Irelberg, Some Common Foot Disabilities in Children and Adults
Dr. Leon Schiff, Tests of Liver Functions in Health and in Disease
Dr. William A. Altmeier, Penicillin: The Management of Surgical Infections

Dr. Wayland B. Recker, Leipsic, is president of the society and Dr. John M. Leahy, Tiffin, secretary.

Industrial Disbursements.—The Industrial Commission of Ohio disbursed \$3,457,727.45 for medical services to injured Ohio workmen during 1943, according to the *Ohio State Medical Journal*. This figure includes a relatively small amount for dental services. Other expenditures during the year included \$1,801,325, hospital care and nursing, \$130,821.34, funeral expenses, and \$97,001.18 court costs, a total of \$5,486,874.97. These amounts include payments covering treatment of injured private and public employees as well as similar costs on occupational diseases and are in addition to death awards and compensation to injured workmen. Comparative figures for 1942 were \$4,243,069.09 for medical services, \$1,760,898.69 for hospital care and nursing, \$133,104.41 for funeral expenses and \$86,661.34 for court costs, a total of \$6,223,733.53. The considerable decrease in 1943 of the amount disbursed for medical service is of no special significance, as a change by the auditing department of the Industrial Commission in the method of compiling records in 1942 resulted in the inclusion in the 1942 figure of approximately \$800,000 of medical fees which had been allowed late in 1941 but were actually paid in 1942. The amount disbursed by the commission for medical service during 1941 was \$3,322,792.06. The number of claims filed during 1943 was 331,072, a record for the thirty-two year history of the Ohio Workmen's Compensation Fund. There were 320,793 claims filed in 1942, the previous peak year. The total for 1932, during the depression, was 130,099. Medical only claims involving payment for physicians' services but no compensation to the claimant for loss of time, num-

bered 260,150 in 1943, or 78.6 per cent of all claims filed, compared with 80 per cent in 1942. The average fee of "medical only" claims increased from \$7.69 in 1942 to \$7.88 in 1943.

PENNSYLVANIA

Philadelphia

Another Cancer Prevention Clinic.—On August 10 the International Cancer Research Foundation sponsored the opening of a cancer prevention clinic at the Jeanes Hospital, Fox Chase, under the direction of Dr. Elizabeth W. F. Love, medical director, and Dr. Hoke Wammock, medical chief of staff. This is the sixth of these clinics operating in Philadelphia at the present time (*THE JOURNAL*, August 26, p. 1200).

Changes at Woman's Medical College.—Recent changes on the faculty of the Woman's Medical College of Pennsylvania include the following appointments:

James O. Brown, Ph.D., to associate professor of anatomy and acting head of the department.

Dr. Ruth Hartley Weaver to acting associate professor of preventive medicine.

Dr. Francis H. Murray to clinical assistant professor of proctology.

Dr. Mary E. McKee Porter to assistant director of the clinical laboratory.

Promotions on the faculty include:

Gina Castelnovo, Ph.D., to assistant professor of anatomy.

Dr. Helen M. Angelucci to clinical associate professor of gynecology.

Dr. Laura E. McClure to clinical associate professor of pediatrics.

Dr. Harriet M. Felton to clinical assistant professor of pediatrics.

UTAH

State Medical Election.—Dr. Ray T. Woolsey, Salt Lake City, was chosen president-elect of the Utah State Medical Association at its recent meeting in Salt Lake City, August 24, and Dr. Ezekiel R. Dumke, Ogden, was installed as president. Drs. Roy W. Robinson, Kenilworth, Horace Asa Dewey, Richfield, and John P. Burgess, Hyrum, were chosen vice presidents; Dr. David G. Edmunds, Salt Lake City, constitutional secretary, and Dr. Hyrum R. Reichman, Salt Lake City, treasurer. Dr. David P. Whitmore, Roosevelt, was named honorary president; Mr. W. H. Tibbals, Salt Lake City, was reelected executive secretary of the association. The 1945 meeting will be held in Ogden.

GENERAL

American Pediatric Society.—The fifty-fifth annual meeting of the American Pediatric Society will be held at the Hotel Claridge, Atlantic City, N. J., September 26-27, under the presidency of Dr. James L. Gamble, Boston. Included among the speakers will be:

- Dr. William L. Bradford, Rochester, N. Y., Effectiveness of Sulfadiazine and Antipertussis Serum in the Treatment of Pertussis
- Dr. Stewart H. Clifford, Brookline, Mass., Clinical Significance of Yellow Straining of the Vertebrae, Skin and Umbilical Cord in the Newborn
- Dr. Harriet G. Guild, Baltimore, Acute Idiopathic Porphyria with Repeated Attacks of Peripheral Neuritis: Treatment with Liver Extract
- Dr. Josef Warkany and Elizabeth Schraffenberger, Cincinnati, Congenital Malformations of Eyes Induced by Maternal Vitamin A Deficiency
- Dr. Daniel C. Darrow, Hamden, Conn., Intestinal Alkalosis
- Dr. Sidney Farber, Boston, Nature of Some Diseases Ascribed to Disorders of Lipid Metabolism
- Dr. Arild E. Hansen and Hilda F. Wiese, Ph.D., Minneapolis, Clinical and Lipid Studies on Child with Chylous Ascites
- Drs. L. Emmett Holt Jr. and Victor A. Najjar, Baltimore, Bio-synthesis of Vitamins in Man
- Dr. Laslo Kajdi, Baltimore, Comparison of the Effect of Vitamin D and Citrates on Mineral Metabolism in Late Rickets
- Drs. Benjamin Kramer and Benjamin Phillips, Brooklyn, Chemotherapy of Staphylococcus Aureus Infections in Infants
- Dr. Charles A. Weymuller, Brooklyn, Use of Sulfathiazole Ointment for Impetigo in Infants
- Dr. Milton Rapoport and Mitchell I. Rubin, Philadelphia, Influence of Sulfonamide Therapy on the Course of Acute Glomerulonephritis
- Dr. Charles Hendee Smith, New York, Self Feeding of Infants
- Dr. Julian D. Boyd, Iowa City, Clinical Significance of Head Size of Infants
- Dr. Ethel C. Dunham, Washington, D. C., Effect of Rickets in Infancy on the Pelvis in Adolescence
- Drs. Donovan J. McCune and Brunhild Bruch, New York, Basal Metabolism of Children. Further Observations on Obese Children Which Suggest the Superiority of Standards Based on Weight
- Dr. Francis F. Schwenker, New York, Type Specific Vaccination Against Streptococcal Infections
- Drs. Joseph Stokes Jr. and Tzyee N. Harris, Philadelphia, Three Year Study of the Clinical Applications of Disinfection of Air by Glycol Vapors
- Dr. John A. Toomey, Cleveland, Attempts to Isolate Polio-myelitis Virus in Fish
- Dr. Irvine McQuarrie and Mildred R. Ziegler, Ph.D., Minneapolis, Metabolic Studies in a Case of Familial Periodic Paralysis
- Dr. Harry Bakwin, New York, Pseudodoxia Pediatrica

On Wednesday there will be a symposium on "Crying of Newly Born Babies: Community Aspects" presented by Dr. C. Anderson Aldrich, Rochester, Minn.; Chieh Sung, Catherine Knop, Geraldine Stevens, R.N., and Margaret Burchell on Wednesday. The meeting Tuesday evening will be a joint session with the Society for Pediatric Research.

American Public Health Association.—The second wartime public health conference and the seventy-third annual business meeting of the American Public Health Association will be held at the Hotel Pennsylvania, New York, October 2-5, under the presidency of Dr. Felix J. Underwood, Jackson, Miss. Laboratory technic, epidemiology, industrial hygiene, school health, food and nutrition, vital statistics, dental health, public health education and maternal and child health will be among the various sessions, and speakers will include:

- Major Walter P. Havens Jr., M. C., Dr. Robert Ward and Victor A. Drill, Ph.D., New Haven, Conn., Epidemiologic Studies on Infectious Hepatitis
- Howard J. Shaughnessy, Ph.D., and Frances I. Friewer, Chicago, Excretion of Typhoid Bacilli by Carriers: Comparative Value of Fecal and Bile Specimens in Their Detection
- S. Edward Sulkin, Ph.D., Dallas, Texas, The Effect of Environmental Temperature on Experimental Influenza in Mice
- Dr. Charles M. Carpenter, Rochester, N. Y., The Development in Vitro of Penicillin Faststrains of the Gonococcus
- Nathan Snaai, Dr. P.H., Ann Arbor, Mich., Scope, Administration and Financing of a National Health Service
- Irene G. Macy Hoosier, Ph.D., Detroit, Implications of Nutrition in the School Health Program
- Dr. Milton J. E. Senn, New York, The Influence of Psychologic Factors on the Nutrition of Children
- Drs. Guillermo Arbona and Pablo Morales Otero, San Juan, P. R., Public Health in the Tropics

Raymond B. Fosdick, LL.D., New York, will deliver the third annual Delta Omega Lecture Tuesday evening on "Public Health as an International Problem." A special session Wednesday will be devoted to "Today's Global Frontiers in Public Health"; for South America, Major Gen. George C. Dunham, M. C.; for China, Dr. Szeming Sze; for Great Britain, Dr. Melville D. Mackenzie, and for the United States, Thomas Parran, Surgeon General of the Public Health Service. On Thursday morning there will be a demonstration of cooperative effort for health education of workers on the job in New York by:

- Dr. Jacob H. Landes, The Plan of the Fort Greec Industrial Health Committee
- Louis Hollander, Cooperation in the Plan
- Dr. L. Holland, Cooperation in the Plan
- Kenneth D. Wic, Cooperation
- Dr. Charles F. McCarty, Organized Medicine's Cooperation
- Philip R. Mather, Role of the National Voluntary Agency

Another session the same day will be devoted to "The Effect of War on Tuberculosis" with the following speakers: Godia J. Drolet, New York, "World War I and Tuberculosis"; Dr. James A. Doull, Cleveland, "Tuberculosis in England and Other Countries at War"; Mary V. Dempsey, New York, "Current Tuberculosis Statistics in the United States"; Col. Esmond R. Long, M. C., "Tuberculosis in the Armed Forces," and Herman E. Hilleboe, medical director, U. S. Public Health Service, "Small Film Radiography Among Industrial Groups." "Industry versus Venereal Disease" will be the theme of a program sponsored by the American Social Hygiene Association Monday evening, October 2. The session will be presided over by Dr. Victor G. Heiser, Bantam, Conn., consultant, committee on industrial health, National Association of Manufacturers, and speakers will include:

- Mr. Reginald E. Gilmor, president, Sperry Gyroscope Company, Long Island, N. Y.
- Dr. William L. Weaver, medical director, Du Pont Rayon Plant, Richmond, Va.
- Mr. Abraham Blue-tun, executive director, Labor League for Human Rights, American Federation of Labor.
- Mr. Percy Shostac, consultant on industrial cooperation, American Social Hygiene Association

Other groups meeting during the public health session will include, among others, the American Association of Public Health Dentists, the American School Health Association and the American Society for Research in Psychosomatic Problems.

FOREIGN

Personal.—Dr. Pasteur Vallery Radot, Paris, is the new French minister of health.

Physicians for India.—A program intended to train about 300,000 physicians over a period of about thirty years has been adopted by the health survey and development committee, set up by the government of British India under the reconstruction committee of the council, the New York Times reported August 28. The plan would provide at least one doctor for each thousand of the population, compared with the present ratio of about one doctor to 10,000. The scheme is to be developed and expanded every five years and the work completed in six stages, it was stated. Existing medical institutions would have to be enlarged and new ones established and a public health directorate with a network of provincial auxiliaries would be needed, it was said.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 19, 1944.

Whole Stomach Extract in the Treatment of Infantile Pellagra

From the Non-European Hospital at Johannesburg, T. Gillman and others report remarkable results in the treatment of infantile pellagra (*Nature*, August 12, p. 210). During the last three years nearly 300 children suffering from acute malnutrition have been admitted. More than 60 per cent of these manifested signs of infantile pellagra. The dominating features were edema of the limbs and, in severe cases, of the face, eyelids and genitals. The edema was associated with pellagrous skin lesions on the legs, buttocks, back, arms and face, gray hair or alopecia and patchy or diffuse dermal pigmentation. The stools as a rule were bulky, pale and foul smelling and contained much unsplit fat. The serum proteins were extremely low and there was a mild microcytic anemia. The liver was extremely fatty.

The unresponsiveness of this condition to vitamin therapy, including nicotinic acid, and a death rate of 90 per cent have been recorded by Trowell. It was therefore necessary to seek some other treatment. By improved liver biopsy Gillman and his group established that the microscopic appearances of the liver is a valuable method of assessing the severity of the condition. They studied 20 children by this method and treated them in three ways. They treated 7 with thiamine hydrochloride, nicotinic acid or brewers' yeast. Only 1 survived. Another 7 were given liver extract intramuscularly. Five survived and recovery was slow. Six were treated with 10 Gm. of desiccated hog's stomach and 10 cc. of tenth normal hydrochloric acid daily for five days. The response was dramatic: all survived. The loss of edematous fluid was shown by a fall in weight of 1 to 1½ pounds (450 to 675 Gm.) in twenty-four hours. The clinical condition remarkably improved, and the liver became almost free from fat in two weeks.

Whole extracts of hog's stomach have been occasionally used in the treatment of pellagra in adults with good results. In 7 severe cases in adults Gillman and his collaborators found the substance much more effective and rapid in its results than nicotinic acid and other vitamins. They draw the following conclusions: 1. Stomach extract is life saving in severe infantile pellagra. 2. It can be regarded as a lipotrope in view of its rapidity in depleting fat from the liver. 3. As both adults and infants respond to a single form of therapy there is no justification for regarding infantile and adult pellagra as different diseases.

Tuberculosis in Nurses

A survey of tuberculosis in nurses, organized by the Royal College of Physicians under the terms of a special bequest, has been carried out by Dr. Marc Daniels. It is the only survey of the sort in this country large enough to produce data of statistical value. The number of nursing entrants in the survey up to March 1943 was 3,764. Shortly after entry to the preliminary training school they were given Mantoux tests and x-ray examination. In the tests, 50.3 per cent were positive to old tuberculin 1 in 10,000 or 100,000, 30.5 per cent were positive only to 1 in 100 or 1,000 and 19.2 were negative. A change from negative to positive reaction (Mantoux conversion) in the first year took place in 58.4 and 78.3 per cent of two hospital groups respectively. Most of these nurses had no notable symptoms between the last negative and the first

positive test. A study was made of the tuberculosis morbidity in nurses with a clear x-ray film on entry, disclosing that 33 cases occurred in 452 nurses initially Mantoux negative and 43 cases in 2,120 initially Mantoux positive. The annual case rate was 7.4 per thousand in nurses who were Mantoux positive on entry and 18.8 in those who were Mantoux negative.

The important fact emerges that tuberculous morbidity was two and one-half times higher in nurses who were Mantoux negative on entry than in those who were Mantoux positive. The explanation is that those who are Mantoux positive on entry are a selected population in whom primary infection has produced no perceptible lesion or who have recovered from a lesion. Therefore the percentage succumbing to infection will be lower in this group than in the Mantoux negative nurses, who are an unselected group. Special care must be taken of the young nurse who is Mantoux negative on entry. She should not be required to work in a ward set aside in a general hospital for tuberculous cases. X-ray examinations and tuberculin tests should be repeated at frequent intervals and particular care given if the test is found to be changing from negative to positive.

Color Film Record of Tongue Movements in Speech

A color film record of the tongue movements in speech, the first ever made, is described in *Endeavor*, the quarterly review of scientific progress published by Imperial Chemical Industries. The authors are a physiologist, Mr. J. Yule Bogue and Mr. Dennis Fry, who since 1939 has been occupied in research for the Royal Air Force into problems connected with the transmission and reception of speech signals. To make the film a man aged 72, whose tongue was exposed to view as the result of an operation involving removal of the right cheek, was used. A film record of the tongue movements was taken at the normal rate of twenty-four frames a second. A simultaneous record was made of the subject's speech. Thus it is possible to compare the pictures with the sounds corresponding to the tongue movements. The film sound track supplies a rough indication of the wave form of the sound that is being produced. In addition to these records made at normal speed, photographs were taken at high speed for frame by frame analysis in conjunction with cathode ray oscillograms of the speech taken at the time. The film is not only of scientific interest but also of assistance in speech therapy. It has been welcomed by the Air Force as a contribution toward the rehabilitation of flying men with facial injuries who have to be taught to speak again.

Vital Statistics

The remarkable fact that our vital statistics have improved during the war has been reported in previous letters to *THE JOURNAL*. The latest official figures for the quarter ended March 31 have just been published. They show a birth rate of 17.9 per thousand of population, which is the highest rate for the first quarter of the year since 1926. Thus there is some reversal of the declining birth rate, which was not sufficient for the maintenance of our population. Births exceed deaths by 37,941. The provisional infant mortality rate was 58 per thousand live births. This was 14 below the average for the preceding ten first quarters and the lowest on record. Marriages for the quarter numbered 62,599, lower by 12,972 than the average for the five years prior to 1943 but 8,338 higher than the corresponding first quarter average for the five years immediately preceding the war. The greatly increased marriage rate produced by the outbreak of war—which not only removed unemployment but gave family allowances to members of the fighting forces—could not be expected to continue at the same level.

PALESTINE

(From a Regular Correspondent)

JERUSALEM, Aug. 1, 1944.

Statistics on Physicians in Palestine

Second in a series of publications issued by the Central Bureau of Medical Statistics is a report of investigations carried on by Prof. R. Bacchi, in cooperation with Dr. Serolovitz, of Palestinean economic conditions with reference to physicians, both now and in the future, when the end of the war will create an entirely unprecedented situation. Interwoven with the problems of immigration and demobilization of physicians is the question of the necessity of establishing a faculty of medicine as part of the Hebrew University in Jerusalem.

The introductory chapter of the study deals with the peculiar structure of the medical profession in Palestine since 1921. At that time there were 129 Jewish physicians, or 23.6 per 10,000 Jewish inhabitants. At the same time non-Jewish physicians numbered 120, or 2.47 per 10,000 non-Jewish inhabitants. The further development may be seen in the accompanying table giving the percentages of Jewish and non-Jewish physicians in relation to the corresponding number of inhabitants. According to government statistics, the total number of physicians practicing in Palestine in 1941 was 2,244.

Physicians per 10,000 Inhabitants

	1922-24	1931-33	1934-36	1937-39	1940-42
Jews	23.6	21.9	45.1	44.1	45.9
Non-Jews....	2.47	2.18	2.25	2.44	

An analysis of the figures shows that in the non-Jewish population of Palestine the percentage of physicians has remained the same during the past twenty years (and is, moreover, one of the lowest in the world: United States [1942] 13.3, England [1932] 9.4, Switzerland [1938] 8.2, Finland [1936] 6.2).

For the Jewish population, the number of physicians in relation to the number of inhabitants was, even in 1921, double that of the international average, while by 1941 it had grown to twice as much. There is no doubt that the Jewish population of Palestine has an excess of physicians.

But what will happen if for any reason no influx of new physicians from abroad takes place and training facilities for physicians are not provided for in this country? For the coming ten or twenty years the present number of physicians will suffice for a population of three quarters of a million. After about twenty years a crisis may develop, and in 1972 practically all physicians will have disappeared. Such an event can naturally be forestalled by establishing a faculty of medicine at the Jerusalem University. An additional thirty-five physicians every year will suffice to meet the demand of the present Jewish inhabitants. The first group of fully trained physicians can be expected by the year 1953 if training is started in the near future.

Remittent Rural Fever (Febris Remittens
Agricolarum)

According to data presented by Dr. J. Yatom in 1940, 245 inmates of the Mikveh Israel Agricultural School (218 students and 36 teachers) contracted an infectious disease of an outspokenly remittent character. The maximum temperature, 104 F., was recorded in the afternoon, this rise being accompanied by rigor, which subsided as soon as sweating set in. Occasionally elevation of temperature occurred during the night too. During the day the temperature was normal but the patients complained of violent headache, particularly supra-orbitally, and of pain in the muscles. Immediately after the temperature had reached its maximum the patients felt exceptionally well and ate with good appetite. This intermittent fever

lasted from four to twelve days. The pulse rate inclined toward bradycardia. Even during the first few days the spleen was palpable, while the liver could be felt only occasionally. The blood was characterized by leukopenia, with relative increase in monocytes. Epidemiologically the following facts could be established: Contact or food infection could be ruled out. Sixty-two per cent of the students were recent immigrants to the country, while the majority of the remaining 38 per cent came from towns. Only a small number of children from rural areas contracted the infection, while agricultural workers from Turkey, Persia and Mesopotamia who were employed at the settlement were spared altogether. It seems probable, therefore, that immunity after earlier infection must be taken into consideration. There was no indication of transmission by insects. The probable carrier of the infection is a special type of micro-tus, since prior to and during the epidemic a great number of these field mice were found. It is assumed that the germ was present in the fields and in the harvest and reached susceptible persons through the skin.

Venereal Diseases Among the Jewish
Population of Palestine

In an article by Dr. A. Dostrovsky and Dr. F. Sagher, the incidence of venereal diseases among the Jewish population of Palestine is discussed. The data published by the authors refer to inpatients as well as outpatients of the Hadassah University Hospital in Jerusalem, and it is pointed out that caution should be exercised in applying them to the country as a whole. Among the 116,276 patients registered at the dermatologic outpatient department during the years 1920-1942, there were 986 venereal cases, or an incidence of 0.85 per cent. Six hundred and twenty of the patients were suffering from syphilis, 355 from gonorrhea and 11 from ulcus molle. In Jews of Oriental origin venereal diseases were twice as frequent as in Ashkenazim. The highest figures recorded were those for the years immediately following the first world war (1920, 2.7 per cent; 1922, 1.7 per cent). In 1942 the figure dropped to 0.2 per cent. The war years 1939-1942 have "so far shown no increase, although a similar postwar peak should be expected this time too."

Although the study has the shortcomings of all venereal disease statistics, it has, on the other hand, the advantage of covering a period of twenty-two years, so that there is some justification in applying the result to the Jewish sector as a whole. It may be concluded that the incidence of venereal diseases among the Jews of Palestine is actually very low.

Marriages

ROBERT FREDERICK LAMAR, Kansas City, Mo., to Miss Hazel M. Swanson of New Bedford, Mass., in Brisbane, Australia, March 21.

WILLIAM CASPER KITE JR., Oklahoma City, to Miss Dorothy Ann Havener of Middletown, N. Y., September 2.

DALE BRYAN PARSHALL, South Bend, Ind., to Miss Margaret Grace McDaniel in Pickens, S. C., August 5.

MARGUERITE PATRICIA MCCARTHY, Syracuse, N. Y., to Mr. Bertram James Brough of New York, July 11.

LEOPOLD A. SCHNEIDER, Ninety Six, S. C., to Miss Inez Jennings Holloway of Chappells, August 16.

LATHA MITCHELL DONALSON, Fayetteville, Tenn., to Miss Claudie May Taylor in Franklin, August 1.

ELLET HALLER DRAKE, Mobile, Ala., to Miss Frances Margaret Moyer at Spring Hill, August 15.

WILLIAM CHARLES GAUNT, Rochester, Texas, to Miss Eugenia Tate of Kountze in July.

ROY YOUNG, Port Arthur, Texas, to Miss Evelyn Craven of Chattanooga, Tenn., May 1.

Deaths

Joelle Cornelius Hiebert @ Lewiston, Maine; Boston University School of Medicine, 1923; clinical instructor of obstetrics at his alma mater from 1924 to 1931 and instructor of preventive medicine and first aid, Gordon Theological College, from 1929 to 1931; director of the Androscoggin County Tuberculosis Association; member of the American College of Hospital Administrators, American Hospital Association, American Protestant Hospital Association and the American Society for the Control of Cancer; a trustee and president in 1941-1942 of the New England Hospital Assembly; member and past president of the Maine Hospital Association; a member of the Boston Hospital Superintendents Club and the Maine Civilian Defense Committee; member of the advisory council of the Maine State Department of Health and Welfare; trustee of Oak Grove School, Vassalboro; on the editorial board of the *Journal of the Maine Medical Association*; resident physician and superintendent of the Medical Mission Dispensary from 1924 to 1931; since 1931 medical superintendent of the Central Maine General Hospital, where he died June 8, aged 51.

James Henry Taylor, Indianapolis; Indiana Medical College, Indianapolis, 1878; member of the Indiana State Medical Association; professor emeritus of pediatrics at the Indiana University School of Medicine; past president of the Indianapolis Medical Society; president of the board of trade of Indianapolis, 1915-1916; served as president of the Summer Mission for Sick Children and as a member of the Family Welfare Board; formerly a member of the board of aldermen; for many years visiting physician at the Indianapolis Orphans' Home; one of the founders and for many years president of the Arsenal Building and Loan Association; died July 23, aged 81.

David Powrie Maitland, Jackson, Minn.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891; member of the Minnesota State Medical Association; past president of the Jackson County Medical Society; for over twenty years chairman of the board of health of Jackson; served as coroner of Jackson County; during World War I had been examining physician and a member of the Jackson County Draft Board; for many years also served on the United States Pension Board; examining physician for the local Selective Service Board during World War II; died June 25, aged 77, of coronary heart disease.

Alexander Alexion, New York; National University of Athens School of Medicine, Greece, 1897; died July 30, aged 71, of cerebral hemorrhage.

Oscar Henning Anderson @ Plum City, Wis.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1909; owner of the Plum City Hospital; died in St. Luke's Hospital, St. Paul, Minn., June 20, aged 60, of congestive heart disease with edema, hypertensive heart disease and pulmonary embolism.

James Eddy Arnold, Minneapolis; Rush Medical College, Chicago, 1917; formerly village health officer and school physician for Mountain Iron, Minn.; on the staff of the Minneapolis General Hospital, where he died July 17, aged 54, of coronary sclerosis and diabetes mellitus.

Frederick William Becker, Newark, N. J.; College of Physicians and Surgeons, New York, 1888; also a pharmacist; member of the Medical Society of New Jersey; formerly member of the city board of health; served on the staff of the Newark City Almshouse, Maplewood; died in the Presbyterian Hospital July 11, aged 83, of uremia and hypertrophy of the prostate.

Glenn A. Brandt, Palo, Iowa; Keokuk Medical College, College of Physicians and Surgeons, Keokuk, 1901; member of the Iowa State Medical Society; died in Shellsburg June 8, aged 71, of injuries received when the automobile in which he was driving was struck by a train.

Michael Joseph Buck, Wilkensburg, Pa.; Jefferson Medical College of Philadelphia, 1872; Hahnemann Medical College of Philadelphia, 1876; died in the Western Pennsylvania Hospital, Pittsburgh, June 14, aged 92.

Judson Charles Cole, Emmett, Kan. (licensed in Kansas in 1901); at one time coroner of Atchison County; formerly on the staff of the Atchison, Topeka and Santa Fe Railway Hospital, Topeka; died June 25, aged 84, of uremia.

Edna Bowden Dayton, Remsenburg, N. Y.; Woman's Medical College of Pennsylvania, Philadelphia, 1913; died July 11, aged 66, of sinus heart block.

Charles A. Dimond, Keokuk, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1903; member of the Iowa State Medical Society; served as a member of the city council and for many years city physician; died June 11, aged 73, of chronic endocarditis.

William H. Douglass, Benton City, Mo.; Barnes Medical College, St. Louis, 1898; honorary member of the Missouri State Medical Association; died in Mexico May 1, aged 69, of arthritis.

Bishop L. Elam, Centralia, Okla. (licensed in Oklahoma under the act of 1908); served as mayor of Centralia; died May 8, aged 71.

Sidney A. Faulkner, Whitney, Texas; Louisville (Ky.) Medical College, 1890; died June 8, aged 77, of heart disease.

James Murray Fettes, Spencer, Iowa; Trinity Medical College, Toronto, Ont., Canada, 1904; died June 6, aged 64.

Arthur John Fletcher @ Danville, Ill.; Northwestern University Medical School, Chicago, 1909; member of the American Academy of Pediatrics; president of the Vermilion County Medical Society; veteran of the Spanish-American War and World War I; on the staffs of the Lake View Hospital and St. Elizabeth Hospital, where he died July 24, aged 65, of heart disease.

Archibald Whittington George @ Detroit; Baltimore Medical College, 1911; a charter member and formerly a director of the American Association of Industrial Physicians and Surgeons; chief surgeon of the Packard Motor Car Company for many years; on the staff of the Harper Hospital, where he died July 21, aged 60, of sarcoma of the left ureter.

Robert Marion Golson, Prattville, Ala.; University of Tennessee Medical Department, Nashville, 1891; member of the Medical Association of the State of Alabama; died July 15, aged 78, of arteriolar sclerosis.

Morton Guzy @ Bridgeton, N. J.; Medical College of Virginia, Richmond, 1939; served an internship at the Jewish Hospital in Philadelphia; secretary of the Bridgeton Hospital staff; died July 20, aged 29, of coronary thrombosis and diabetes mellitus.

Sherwood Ackler Haggerty, Richfield Springs, N. Y.; Albany Medical College, 1895; died June 15, aged 73, of lymphosarcoma.

John Arthur Lamb, Kalispell, Mont.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1898; member of the Montana State Medical Association; served during World War I; captain, medical reserve corps, U. S. Army, not on active duty; on the staff of the Flathead County Hospital; on the courtesy staff of the Kalispell General Hospital; city health officer and local registrar; died June 20, aged 70, of carcinoma of the liver and pancreas.

Morris Hallowell Layton Jr. @ Harrisburg, Pa.; Medico-Chirurgical College of Philadelphia, 1910; died in the Harrisburg Hospital June 4, aged 56, of cerebral hemorrhage.

Daniel Guy Leach, Tucson, Ariz.; Central College of Physicians and Surgeons, Indianapolis, 1901; died June 24, aged 65.

Joseph Levy, New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1902; member of the Louisiana State Medical Society; for many years on the staff of the Charity Hospital; died July 8, aged 64.

Charles Patterson Marsh, Petersburg, Tenn.; University of Nashville Medical Department, 1909; served in France during World War I; died July 5, aged 61.

Jessie Laird Robb Marshall, New York; University of Birmingham Faculty of Medicine, England, 1924; physician at Teachers College of Columbia University and the Horace Mann-Lincoln School; lecturer on child health at Columbia University; died in St. Luke's Hospital July 19, aged 45, of peritonitis caused by a carcinomatous growth.

Flora Eva Frost Moody @ Springfield, Mass.; Tufts College Medical School, Boston, 1898; died June 26, aged 73, of cerebral hemorrhage, hypertension and osteoarthritis.

Julius Daniel Mueller, Flandreau, S. D.; Creighton University School of Medicine, Omaha, 1931; served an internship at the Dr. W. H. Groves Latter-Day Saints Hospital, Salt Lake City, Utah; on the staff of the Flandreau Municipal Hospital; coroner for Moody County; died June 29, aged 39, of injuries received when crushed by a truck.

Emil Alfred Muller, Glen Cove, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1898; died June 13, aged 67, of arteriosclerosis, hypertension and acute cardiac failure.

James Moffett Norris, Northampton, Mass.; Western Reserve University School of Medicine, Cleveland, 1935; served an internship at the Charity Hospital in Cleveland and the LaFayette Home Hospital in LaFayette, Ind.; captain in the medical reserve corps, U. S. Army; served on the staffs of Veterans Administration facilities in Lyons, N. J., Sunmount, N. Y., and Northampton; died July 15, aged 39.

Lovett E. Park, Columbus, Ohio; Eclectic Medical Institute, Cincinnati, 1889; formerly on the staff of the Institution for Feeble-minded; died July 12, aged 81.

Robert Alex T. Patterson, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1900; died in the Philadelphia General Hospital in July, aged 67, of carcinoma of the lung.

Marcellus Leroy Peterson, Cincinnati; Eclectic Medical Institute, Cincinnati, 1899; served during World War I; lieutenant colonel in the medical reserve corps of the U. S. Army from Feb. 21, 1941 to Nov. 27, 1943, when he was relieved from active duty because of age; died in the Bethesda Hospital June 15, aged 66, of ruptured myocardial infarct with intrapericardial hemorrhage.

Alfred Noroton Phillips, Glenbrook, Conn.; College of Physicians and Surgeons, New York, 1883; member of the Connecticut State Medical Society; formerly an executive of the Phillips Chemical Company; a director of the Stamford Hospital, Stamford; died August 1, aged 88.

Leo Francis Pierotti, Memphis, Tenn.; St. Louis University School of Medicine, 1931; member of the Tennessee State Medical Association; served an internship and a residency in surgery at St. Mary's Group of Hospitals in St. Louis; formerly an intern, secretary and member of the staff at St. Joseph's Hospital, where he died July 15, aged 37, of coronary occlusion.

William Henry Pipes, Jackson, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1906; member of the Louisiana State Medical Society; died July 8, aged 66.

John Rogers Pollock * Ardmore, Okla.; Chicago College of Medicine and Surgery, 1909; died June 28, aged 61.

Herbert Ellis Rodley, Chico, Calif.; College of Physicians and Surgeons of San Francisco, 1910; died in the Enloe Hospital July 5, aged 60, of cardiac decompensation.

Clement E. V. Sams, Haven, Kan.; American Medical College, St. Louis, 1894; died in June, aged 75, of coronary occlusion.

Richard Savine, Long Island City, N. Y.; Long Island College Hospital, Brooklyn, 1907; member of the Medical Society of the State of New York; died July 19, aged 67, of cerebral hemorrhage.

Bert D. Shedd, Arcade, N. Y.; Cleveland Homeopathic Medical College, 1898; member of the Medical Society of the State of New York; formerly mayor, school physician, county coroner and health officer; died July 18, aged 72, of coronary embolism.

Joseph Leslie Sherrick * Monmouth, Ill.; Johns Hopkins University School of Medicine, Baltimore, 1914; fellow of the American College of Physicians; served an internship at the Massachusetts General Hospital, Boston, 1914-1915; on the staff of the Monmouth Hospital; trustee, Monmouth College; director of the Second National Bank and associate medical director of the Illinois Bankers Life Assurance Company; died July 28, aged 56, of heart disease.

Arthur Montell Smith * Piedmont, Calif.; Cooper Medical College, San Francisco, 1899; an Affiliate Fellow of the American Medical Association; fellow of the American College of Physicians; formerly a member of the state board of medical examiners; during World War I served overseas as a captain in the medical corps of the U. S. Army; served as chief of medical service, Samuel Merritt Hospital, Oakland, where he died July 21, aged 72, of heart disease.

Rose Marie Vastola Smith, Rome, N. Y.; University of Buffalo School of Medicine, 1924; served an internship at Buffalo City Hospital, Buffalo; formerly connected with the New York City health department; died in the Station Hospital, Rome Army Air Field, July 6, aged 48, of carcinoma.

William Adelbert Smith, Petersburg, Mich.; Cleveland Homeopathic Medical College, 1903; for many years member and president of the school board; served as village president and as village and township health officer; on the staffs of the Toledo Hospital, Toledo, Ohio, and the Mercy Hospital, Monroe; president of the H. C. McLachlin & Company State Bank; died July 9, aged 67.

Ulysses G. Spohn, Fairgrove, Mich.; Detroit College of Medicine, 1906; member of the Michigan State Medical Society; served on the staff of the Samaritan Hospital, Bay City; died in East Tawas July 22, aged 73, of coronary thrombosis.

Andrew Wilton Springs, Colp, Ill.; National Medical University, Chicago, 1905; formerly physician in charge of the Madison Coal Corporation Hospital in Dewmaine; died July 22, aged 75, of heart disease.

Harry Erskine Tatum, Brunswick, Mo.; Jefferson Medical College of Philadelphia, 1900; member of the Missouri State Medical Association; served as president of the Charleston County Medical Society; county coroner; for many years a member of the school board; died July 1, aged 67, of coronary embolism.

William J. Thompkins, Washington, D. C.; Howard University College of Medicine, Washington, 1905; formerly assistant health commissioner, department of hygiene and communicable diseases, Missouri State Board of Health; served as curator of the Lincoln University, Jefferson City; formerly superintendent of the Kansas City General hospital number 2, Kansas City, Mo.; recorder of deeds for the District of Columbia; died August 4, aged 66.

George Monroe Tolhurst, Atlanta, Ga.; International Medical Missionary College and Training School for Nurses, Atlanta, 1908; died in the Grady Hospital June 27, aged 68, of hypertensive cardiovascular disease.

Frank F. Tourner, Bloomington, Ind.; Kentucky University Medical Department, Louisville, 1899; member of the Indiana State Medical Association; died July 6, aged 85, of hypostatic pneumonia.

James Walter Van Blaricum * Minneola, Kan.; Kansas City (Mo.) Medical College, 1901; for many years member of the school board; died June 4, aged 70, of bronchial asthma.

Fred Ellridge Varney, North Chelmsford, Mass.; Medical School of Maine, Portland, 1886; member of the Massachusetts Medical Society; past president of the Middlesex North District Medical Society; school physician for many years; on the staff of the Lowell General Hospital, Lowell; died June 8, aged 83, of coronary heart disease.

Robert Lee Walker, Crabtree, N. C.; Kentucky School of Medicine, Louisville, 1889; died in the Haywood County Hospital, Waynesville, June 28, aged 80.

James D. Woodley, Indianapolis; Baltimore University School of Medicine, 1891; died May 23, aged 76, of heart disease.

KILLED IN ACTION

Peter Leo Demeter, Webster, Mass.; Middlesex University School of Medicine, Waltham, 1938; served an internship at the Buffalo Columbus Hospital, Buffalo; commissioned a first lieutenant in the medical corps, Army of the United States, on Nov. 4, 1942; later promoted to captain; went overseas in 1943; took part in the North African campaign and the invasion of Sicily; killed in action in Italy, July 26, aged 30.



CAPT. PETER L. DEMETER
M. C., A. U. S., 1914-1944

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

This report is based on studies by the Council and returns on questionnaires sent to medical officers by the Committee on Postwar Medical Service and analyzed by Lieut. Col. Harold C. Lueth, M. C., Surgeon General's Liaison Officer.

POSTWAR PLANNING

EDUCATIONAL FACILITIES REQUIRED FOR RETURNING MEDICAL OFFICERS

VICTOR JOHNSON, M.D., Ph.D.

AND

F. H. ARESTAD, M.D.

Secretary and Assistant Secretary, Respectively, Council on Medical Education and Hospitals

CHICAGO

In November 1942 the Council on Medical Education and Hospitals took cognizance of the fact that medical educational facilities at the graduate and postgraduate levels would be severely taxed in the postwar period because many medical graduates were and would be entering military service with a minimum of training beyond the internship and would desire additional education after the war. At that time the Council embarked on a study of the required facilities to meet this future need. This project was reported to the House of Delegates in April 1943.¹

In its first preliminary report on this study the Council estimated that "... with a normal civilian complement of 5,500 residents the approved hospitals may be called on to furnish a total of 12,000 or 13,000 residencies in the immediate postwar period."² The Council further concluded from its preliminary survey that "... it should be possible to develop the required twelve or thirteen thousand residencies."

In its report to the House of Delegates in April 1944, the Council stated³ that "In the Council's planning for these postwar services it became clear early that we were working entirely on the probable available supply of educational opportunities. The question of demand for them was entirely unknown and will depend (in part) on what the men now in service will desire after the war."

THE SURVEY OF MEDICAL OFFICERS

This very problem was then being attacked by the Committee on Postwar Medical Service. This committee was established by the American Medical Association in collaboration with the American College of Physicians and the American College of Surgeons and also includes representatives of the Association of American Medical Colleges, the American Hospital Association, the Catholic Hospital Association, the Federation of State Medical Boards of the United States, the Procurement and Assignment Service, the Advisory Board for Medical Specialties and the Veterans Administration. A major project of this committee has been a study of the postwar educational desires of medical officers, being conducted with the cooperation of the Surgeons General of the Army, the Navy and the Public Health Service. A questionnaire on this (and other important) questions was devised and has now been mailed to every medical officer in the services. A pilot questionnaire was first sent to 3,000 officers selected at random, representing all age

groups, all services and all theaters of operation. Analyses of the early returns⁴ and a more detailed presentation of the educational plans of the first thousand of the officers replying⁵ have been made by Lieut. Col. Harold C. Lueth.

The latter of these two reports, which appeared in the Forty-Fourth Annual Educational Number of THE JOURNAL by courtesy of the Committee on Postwar Medical Service, provides figures permitting preliminary estimates of the total postwar educational requirements of medical officers and civilian graduates. From these requirements must be subtracted the currently available facilities to indicate what further educational opportunities must be developed to meet the demand.

POSTWAR EDUCATIONAL DESIRES OF MEDICAL OFFICERS

The data in tables 1, 2, 3 and 6 are recapitulations of Lueth's figures.³ Table 1 shows the distribution of officers replying according to year of graduation and the

TABLE 1.—*Postwar Educational Desires of the First 1,000 Medical Officers Replying to a Questionnaire Sent to 3,000 Medical Officers Selected at Random and Representing All Theaters of Operation and the United States*

Group Number	Dates of Graduation	Desire No Educational Training	Desire 6 Months or Less or Unspecified Period	Desire More Than 6 Months Training	Total Replies by Groups
1.....	1941-1943	4	41	119	164
2.....	1938-1940	21	38	148	207
3.....	1935-1937	39	82	69	190
4.....	1930-1934	63	79	80	222
5.....	1920-1929	60	82	38	180
6.....	Before 1920	17	16	4	37
Totals.....		204	338	458	1,000

Note: Since there were 1,000 replies, any figure can be converted to per cent of the officers replying by pointing off one decimal place; 164 becomes 16.4 per cent.

postwar educational desires. No further formal education was planned by 20.4 per cent of all officers replying. Some full time training was requested by 79.6 per cent. Of these 33.8 per cent desired six months or less training, which was classified as review or refresher courses, and 45.8 per cent desired more than six months' training in hospital house officerships. Excluding group 6 (the oldest officers) from whom the fewest replies were received, the replies indicate that with increasing age, on the one hand, there is an increasing tendency to anticipate either no future training or, at most, review and refresher courses when further education is desired. On the other hand, the younger graduates provide most of the requests for hospital training; nearly 60 per cent of such requests came from men who graduated in 1938 or later. These general trends might have been anticipated in advance, but the large totals are surprising, as is also the fact that nearly two thirds of those who graduated before 1930 also desire some further training.

1. J. A. M. A. 121: 1397 (April 24) 1943.

2. J. A. M. A. 124: 40 (Jan. 1) 1944. Compare with estimates in the present report, page 255.

3. J. A. M. A. 124: 1302 (April 29) 1944.

4. J. A. M. A. 125: 558 (June 24) 1944.

5. J. A. M. A. 125: 1099 (Aug. 19) 1944.

DURATION OF TRAINING DESIRED

Table 2 shows the number of courses of varying durations requested by the thousand men who replied. Some officers requested more than one course, since 796 men requested 970 courses. Such instances were more frequent in the shorter courses (average 1.34 courses per officer) than in the longer house officerships (average 1.13 requests per officer).

There was a relatively small number of specific requests for courses of two months or less. Over 60 per cent of the 452 requests for the shorter courses specified three to six months. Of the 518 requests for house officerships, 47 per cent were for nine months or a year, 32 per cent for two years and 21 per cent for three years or more. Almost all of those desiring three years graduated in 1938 or later. The average duration of the 518 house officerships requested was 1.73 years.

TABLE 2.—Number of Courses of Different Durations Requested by 796 of the 1,000 Officers in Groups 1 to 6 Replying to the Questionnaire

Groups	Short Courses Review or Refresher 6 Months or Less						Long Courses Internships, Residencies or Fellowships, More Than 6 Months					Grand Total, Short and Long Courses
	1 Mo.	2 Mo.	3 Mo.	6 Mo.	Duration Not Given	Total	9 Mo.	1 Yr.	2 Yrs.	3 or More Years	Total	
Group 1 (1941-1943).....	0	0	6	23	26	55	0	29	55	57	141	195
Group 2 (1938-1940).....	0	4	18	21	16	59	5	67	56	39	167	226
Group 3 (1935-1937).....	12	7	26	52	19	116	4	36	24	8	72	183
Group 4 (1930-1934).....	11	8	23	46	17	110	17	48	23	5	93	203
Group 5 (1920-1929).....	9	5	27	31	21	93	9	25	6	1	41	134
Group 6 (Before 1920).....	1	0	3	5	10	19	0	4	0	0	4	23
Totals.....	33	24	108	178	109	452	35	209	164	110	518	970

Note: Since nearly 1,000 courses were requested, any figure can be converted into percentage of the courses requested by pointing off one decimal place: 19.6 becomes approximately 19.6 per cent. Note that one man may want 2 or more courses, since 796 men requested 970 courses

INTERNSHIPS AND RESIDENCIES

Table 3 deals with requests for hospital house officerships of nine or more months' duration, classified according to the subject or field of medicine desired.

TABLE 3.—Requests for Postwar House Officer Training of More Than Six Months' Duration from 458 Medical Officers of the 1,000 Who Replied

Field in Which Training is Desired	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Total Groups 1 to 6 by Sub- jects
Anesthesiology.....	1	3	2	..	..	..	6
Dermatology and Syphilology.....	1	1	..	1	1	..	4
.....	23	31	11	9	8	..	87
.....	11	12	9	11	7	1	51
.....	3	..	1	..	..	..	4
.....	20	27	5	7	3	..	62
Ophthalmology.....	1	6	3	2	1	..	17
Orthopedic Surgery.....	3	4	4	13	3	..	27
Otolaryngology.....	13	5	12	..	1	1	11
Pathology.....	5	9	1	1	2	..	18
Pediatrics.....	..	..	..	1	..	..	1
.....	4	6	3	4	3	..	20
.....	..	1	1	..	1	..	3
Radiology.....	1	4	4	3	1	..	13
Surgery.....	52	53	17	21	7	2	134
Urology.....	4	2	3	3	1	..	13
Total courses by age groups.....	141	167	72	93	41	4	518

Note: Since nearly 1,000 (actually 970) courses were requested in this category and that of table 6, any figure can be converted into percentage of all courses desired by pointing off one decimal place: 51.8 becomes approximately 51.8 per cent.

Nearly 70 per cent of the 518 requests for internships and residencies were in the following four fields: surgery (30 per cent), internal medicine (17 per cent), obstetrics and gynecology (12 per cent) and general training, such as a mixed residency or "second year internship" (10 per cent). Less than 5.2 per cent

of the internship and residency requests were for training in each of the remaining fields, and there were less than 1 per cent of the requests for work in each of the following subjects: neurosurgery, dermatology and syphilology, public health, hospital administration and plastic surgery.

ESTIMATED REQUIRED EXPANSION OF HOUSE OFFICERSHIPS

An attempt is made in table 4 to arrive at a tentative estimate of the additional hospital educational facilities which will be required in all fields after the war by all officers seeking more than six months' training. Any such estimates are necessarily hazardous in the extreme, because of several unknown variables which might greatly modify the resulting figures. However, it is essential that an approximation be made at once to facilitate definitive planning.

In table 4, column A, is shown the total number of physicians certified by the American boards in the specialties to 1944. Column B is taken from the figures provided by Lueth's study.⁵ Column C gives provisional estimates of the probable total number of all medical officers in the armed forces who will want more than six months' training. The figures in this column are twenty times the numbers of requests from the first thousand replies (column B) received from the 3,000 officers to whom the pilot questionnaires were sent. This estimate assumes (a) that there are 54,000 medical officers in the services, (b) that there was a fair sampling of the officers receiving the pilot questionnaire, (c) that about one fourth of those requesting training of this kind may be unable to carry out their plans, and (d) that nearly 10 per cent of the 2,000 medical officers to whom pilot questionnaires were mailed, but from whom replies had not been received at the time of tabulation, will take further training similar to that of the officers who replied. The last of these assumptions is probably the most seriously open to question and may later require considerable modification in the light of further returns on the questionnaires of the Committee on Postwar Medical Service. These are now being received at a rapid rate. All information received is being transferred at once to International Business Machine punch cards to facilitate further analysis.

It is of interest to compare the figures of column C with those of column A. An estimated 10,260 officers will seek more than six months of specialty training (but not necessarily certification) after the war. This is nearly one-half the total number of specialists (23,465) now certified by the American boards.

In column D are given the numbers of assistant residents, residents and fellows in the normal prewar year 1941. To obtain the total number of house officerships required, these prewar figures must be added to the estimated numbers of returning medical officers desiring training. This total is given in column E.

The house officer facilities available in 1943 are shown in column F. These currently existing places must be deducted from the total places required (column E) to arrive at a provisional estimate of additional facilities which must be developed, given in column G. Provided the basic assumptions made are reasonably accurate, it appears that nearly 10,000 additional* residencies will be required for returning officers, should demobilization be rather rapid.

ures of column G should be adjusted to the assumption currently in vogue that demobilization will extend over some time.

If we assume that about one half of the medical officers will be discharged and will embark on their postwar educational plans during the first year after the war, a total of approximately 4,590 additional residencies (column H) will be required in addition to the 5,796 now available. Should medical officers in all categories be discharged in equal numbers every three months throughout a two year demobilization period, the numbers seeking hospital positions will be relatively small at first but will mount steadily for two years. Under these conditions the maximum figure will be reached toward the end of the second

TABLE 4.—Additional Postwar House Officerships Required: Tentative Estimates

Field in Which Training Is Desired	Column A Total Certified by American Board to 1944	B Numbers of Requests for Training	C Estimated Numbers from All Medical Officers	D Normal Prewar Numbers: Assistant Residents, Residents and Fellows in 1941	E Estimated Total Postwar Numbers (C Plus D)	F Approved Residencies, Assistant Residencies and Fellowships in 1943 ¹	G Estimated Additional Postwar Facilities Required (E Minus F)	H Estimated Additional Facilities Required if Demobiliza- tion Extends Over 2 Yrs.
Anesthesiology	231	6	120	121	241	128	113	53
Dermatology and syphilology.....	680	4	80	78	158	82	76	36
General training ² .....	.....	51	1,020	183	1,203	154	1,049	539
Internal medicine and subspecialties.....	3,263	84	1,680	1,126	2,806	1,297	1,509	669
Neurologic surgery	149	4	80	36	116	60	56	16
Obstetrics and gynecology.....	1,764	62	1,240	442	1,682	504	1,178	558
Ophthalmology	2,336	25	500	208	708	242	466	216
Orthopedic surgery	860	17	340	200	540	243	297	127
Otolaryngology	3,737	27	540	233	773	229	544	274
Pathology	1,012	11	220	332	552	311	241	131
Pediatrics	2,220	18	360	393	753	389	364	184
Physical medicine ³.....	.....	3	60	5	65	5	60	30
Plastic surgery.....	160	1	20	8	28	6	22	12
Psychiatry and neurology.....	1,716	20	400	497	897	548	349	149
Radiology	2,012	13	260	250	510	281	229	99
Surgery ⁴	2,342	154	3,080	1,007	4,087	1,161	2,926	1,386
Urology	983	13	260	137	397	156	241	111
Totals.....	23,465	513	10,260	5,256	15,516	5,796	9,720	4,590

Note.—Column B includes the courses requested by officers in all age groups (see table 3, last column). The total (513) is 5 less than total in tables 2 and 3 because Hospital Administration (2 requests) and Public Health (3 requests) were omitted. There are no specialty boards or approved residencies in these fields. Column C contains a tentative estimate for the desires of 54,000 medical officers. See discussion on page 254 for method of computation and variables which would modify the estimates. Column H is the estimated number in the first postwar year, if one half of the medical officers are discharged in that year ($C/2 + D - F$).

1. J. A. M. A. 122:1119 (Aug. 14) 1943.

2. This pertains to general hospital training independent of specialties in second year internships or mixed residencies; in columns D and F the figures 183 and 154 are for mixed residencies.

3. Included under Internal Medicine in table 3.

4. Includes Malignant Diseases, Thoracic Surgery, Traumatic Surgery and the subspecialty Proctology.

RATE OF DEMOBILIZATION

The Council on Medical Education and Hospitals has recognized³ that "the rate of demobilization of medical officers will bear significantly on our planning for their postwar training." The estimates contained in table 4 must take this into account, since the additional 9,720 residencies (total of column G) and the total of 15,516 residencies for civilians plus discharged officers (column E) would apply provided all officers desiring such training were discharged within a few months, on conclusion of the war, which is not likely to happen. While the rate of demobilization cannot now be estimated with assurance, the fig-

year of demobilization. At that time a full 75 per cent of all discharged physicians seeking house officerships will be in such positions, which may require about 7,500 residencies in addition to the 5,796 now available.⁶

RESIDENCIES REQUIRED IN SPECIFIC FIELDS OF MEDICINE

Preliminary approximations to the number of hospital positions required in the various specialties are also given in table 4, column H. If our basic assumptions have been reasonably sound, it appears that an increase

6. The total estimated in this way, about 13,300, may be compared with the Council's estimate of January 1944,¹ when a figure of 12,000 or 13,000 was arrived at on the basis of the scanty information then available.

of about 80 per cent will be required during the first year in the total number of residencies and that the percentages of expansion of available places required in the various special fields may be about as shown in table 5. Not included in this table are the following subjects, in which relatively small numbers of officers

TABLE 5.—Percentage Increase in Numbers of Postwar Residencies Which May Be Required: Tentative Estimates

Otolaryngology.....	120%	Orthopedic surgery.....	50%
Surgery.....	100%	Pediatrics.....	50%
			40%
			35%
Urology.....	70%		30%
Internal medicine.....	50%		

evinced interest: anesthesiology, dermatology and syphilology, neurologic surgery, physical medicine and plastic surgery. While some expansion of educational opportunities will be required in these fields, replies from more officers in the services are required to justify hazarding an estimate of the required additional facilities needed.

The field of "general training" requires special mention. In table 4 it is estimated that over 1,000 officers may seek such mixed residencies or second year internships. Although approved mixed residencies in non-internship hospitals numbered only 154 in 1943, it must be remembered that all internship hospitals are also approved for mixed residencies. There are now over 700 such hospitals providing nearly 8,000 internships in peacetime. There seems to be no doubt that these institutions will be capable of providing for the additional requirements for general hospital training.

FULL TIME REVIEW AND REFRESHER COURSES

Review and refresher courses were requested by 338 officers (table 1). The total number requested was 452 courses (table 2), varying in duration from one

TABLE 6.—Requests for Postwar Review or Refresher Courses of Six Months' Duration or Less, from 338 Medical Officers of the 1,000 Who Replied

Field in Which Training Is Desired	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Total Groups 1 to 6 by Subjects
Anesthesiology.....	1	1	2	1	1	1	6
Dermatology and Syphilology.....	..	..	1	1	5	1	8
Hospital Administration.....	..	..	..	..	..	..	1
Internal Medicine.....	11	11	29	17	26	5	99
General Training.....	21	20	18	30	8	6	103
Neurological Surgery.....	1	..	..	..	1	..	4
Obstetrics and Gynecology.....	2	10	23	13	6	..	50
Ophthalmology.....	..	..	6	6	5	..	17
Orthopedic Surgery.....	1	1	3	2	..	..	7
Otolaryngology.....	2	1	3	4	4	..	14
Pathology.....	1	..	2	1	1	..	5
Pediatrics.....	2	1	5	2	5	1	16
Plastic Surgery.....	..	..	..	..	..	..	0
Psychiatry and Neurology.....	2	3	4	3	4	1	17
Public Health.....	..	..	..	1	1	..	2
Radiology.....	1	1	..	4	2	..	8
Surgery.....	10	10	18	20	14	4	56
Urology.....	..	..	1	2	..	..	3
Total requests by age groups.....	55	59	116	110	93	19	452

Note: Since nearly 1,000 (actually 970) courses were requested in this category and that of table 2, any figure can be converted into percentage of all courses desired by pointing off one decimal place: 452 becomes approximately 45.2 per cent.

to six months. The fields in which such training is desired are shown in table 6. The largest number of requests were for work in the same four fields which were most popular in the case of house officerships. Over 75 per cent of the requests were for the following

subjects: general training (23 per cent), internal medicine (22 per cent), surgery (19 per cent) and obstetrics and gynecology (12 per cent). Less than 4 per cent of the requests were for work in each of the remaining fields of medicine.

Again, it is incumbent on us to try to translate the expressed desires of the first thousand officers who replied to the questionnaire sent to 3,000 physicians in the services into the probable demand from all medical officers after the war. This must be done now, even at the risk of seriously miscalculating, and an attempt at this is made in table 7. Recalculations will be made on the basis of the continuing studies of the Committee on Postwar Medical Services.

In this table are given the attendance and the number of courses at various full time postgraduate courses during the year 1943-1944, classified according to duration of training and the specialty or field of interest of the physician.

In the last column of table 7 is given the estimated total number of courses desired by medical officers in the fields indicated.⁷ Expansion of presently available facilities is needed in all of the fields indicated. The most illuminating figures are those of the last two pairs of lines across the bottom of table 7, relating to the duration of the courses available and desired. In 1943-1944 over 90 per cent of the participating physicians were in postgraduate full time courses of one month or less duration. Yet over 90 per cent of the probable demands for short term training will be for courses of about two or more months. It appears that one of the most acute needs for expansion of postwar educational opportunities will be in full time review and refresher courses of two to six months' duration.

TRAINING IN THE BASIC MEDICAL SCIENCES

In the first 1,000 questionnaires returned there was an insignificant number of specific requests for further work entirely limited to the basic medical sciences. However, it must be recognized that sound advanced training in any of the medical fields requested by medical officers must include basic science instruction and review. In planning internships and residencies for returning physicians it is essential to incorporate appropriate work in biochemistry, bacteriology, physiology, anatomy and pathology. Too often, in the typical residency of peacetime, the clinical responsibilities of the physicians allowed insufficient time for such a well rounded educational program.

HOW CAN POSTWAR EDUCATIONAL NEEDS BE MET?

Meeting the requirements of returning medical officers for additional training is a serious responsibility which will require the continued joint efforts of the Committee on Postwar Medical Service, the Council on Medical Education and Hospitals, the Surgeons General of the Army, Navy and Public Health Service, hospitals approved for internships and residencies, the American boards in the medical specialties, medical schools, state licensing boards, the Veterans Administration, foundations, county and state medical societies, and every institution capable of providing advanced training to physicians.

On these physicians rests a large share of the responsibility for the quality of medical care to be provided the nation in the decades following the war. Many entered the services after an abbreviated internship.

7. These figures are twenty times those in the last column of table 6. See page 254 for discussion of the basis for this calculation. Note that table 7 omits estimates in hospital administration, neuro-surgery and public health.

Others recognize the need for further education to equip themselves to return to their former practices or to new locations in which they desire to work.

The Council on Medical Education and Hospitals of the American Medical Association recommends the following, to meet the educational challenge of the postwar period:

1. Every hospital approved by the Council for internships should review its present and potential facilities and be prepared on request to submit to the Council estimates of the additional physicians it can accommodate as house officers in general medical training without jeopardizing high educational standards.

2. Every residency and fellowship hospital approved by the Council and acceptable to the various American

feasibility of allowing credit for such graduate externships in the training requirements for certification.⁸

6. Schools engaged in undergraduate, postgraduate and graduate education, medical societies and foundations should plan especially to meet the probable demands for full time review and refresher courses of two to six months' duration.

7. All participating hospitals and schools should incorporate into all postwar house officer training appropriate work in the basic medical sciences, which will require close cooperation between hospitals, medical societies and medical schools.

8. Consistent with the demands of national security and the postwar military needs, plans for the demobilization of medical officers should provide for teachers

TABLE 7.—Officers Who Will Desire Full Time Review or Refresher Courses: Tentative Estimate

Field of Training	Places Now Available in Short Full Time Courses										Total Available Places in Short Courses		Estimated Additional Places Required by Returning Officers
	About 1 Mo.		About 2 Mo.		About 3 Mo.		3 to 6 Mo.		Variable Length		No. of Physicians	No. of Courses	
	No. of Physicians	No. of Courses	No. of Physicians	No. of Courses	No. of Physicians	No. of Courses	No. of Physicians	No. of Courses	No. of Physicians	No. of Courses			
Anesthesiology	534	3	...	..	...	..	6	1	5	1	545	5	120
Dermatology and syphilology....	55	2	...	...	...	..	...	...	41	10	96	13	160
Internal medicine.....	19,501	86	141	9	9	2	44	7	79	7	19,774	111	1,980
General training.....	2,334	21	43	4	8	1	...	..	73	5	2,458	31	2,060
Obstetrics and gynecology.....	115	7	26	7	10	2	8	1	...	..	159	17	1,120
Ophthalmology	235	11	85	10	...	...	33	2	...	..	353	23	340
Orthopedics	14	3	...	..	...	...	...	...	...	..	14	3	140
Otolaryngology	94	6	24	5	13	2	10	3	7	2	148	18	280
Pathology .....	...	...	...	...	...	..	7	1	25	2	32	3	100
Pediatrics	270	9	21	3	...	..	...	..	...	..	291	12	320
Psychiatry and neurology.....	1,073	7	...	...	...	..	...	..	182	8	1,255	15	340
Radiology	17	1	13	2	8	1	...	..	16	2	54	6	160
Surgery	219	11	74	9	1,415	5	10	1	1	1	1,719	27	1,720
Urology	8	3	...	..	...	..	...	..	...	..	8	3	60
<hr/>													
Total places now available													
Numbers	24,469	170	427	49	1,463	14	118	16	429	38	26,906	287	
Per cent	90.9		1.6		5.5		0.4		1.6				
<hr/>													
Estimated places required by medical officers													
Numbers	660		480		2,160		3,560		2,180				
Per cent	7		5		24		40		24				

Note.—Part time courses (236 in number) which were given to 2,873 physicians in the year 1943-1944 are not included.

The figures given are for numbers of physicians accommodated in short courses in the year 1943-1944 and for the numbers of courses involved.

These preliminary estimates (bottom line and last column) of total postwar short courses required for medical officers were obtained by expanding the requests from 1,000 officers twenty times, as was done in column C, table 5. See discussion of this calculation in text, page 254. The horizontal totals in the last line exceed those of the vertical totals in the last column because the latter does not include estimates of required courses in hospital administration, neurosurgery and public health.

boards should be prepared to submit to the Council and the respective boards estimates of the additional physicians it can accommodate as house officers in already approved residencies, having in mind initially the required expansion estimated in table 5, as well as the necessity for preserving a high quality of training.

3. Every internship hospital not now approved by the Council for residencies should be prepared to report on such facilities it may possess as may warrant consideration for approval of residencies, particularly in those specialties requiring most expansion.

4. Every approved residency hospital which has not yet developed its educational programs to full capacity should consider the organization of additional residencies in specialties not yet approved by the Council.

5. Hospitals approved for house officer training should consider developing graduate externships to provide training of short duration to discharged officers not housed at the hospital but engaged in full time hospital work. Specialty boards should consider the

required for the training of discharged officers to be demobilized before the prospective students.

9. Although it may be necessary to modify the estimates here published when further questionnaires have been returned from medical officers to the Committee on Postwar Medical Service, plans by all medical educational institutions for expanded postwar facilities should commence at once.

10. Full use for educational purposes should be made of the period between the surrender of Germany and that of Japan to provide training for as many officers as possible while still retained on active service.

The Committee on Postwar Medical Service and the Council on Medical Education and Hospitals are moving forward with this program to the end that a complete list of available facilities may be published as soon as possible.

8. The American Board of Psychiatry and Neurology has already considered this plan, which was first suggested to the Council by that board.

Medical Examinations and Licensure**COMING EXAMINATIONS AND MEETINGS****NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES**

Examinations of the Examining Boards in Specialties were published in THE JOURNAL, Sept 16, page 190

BOARDS OF MEDICAL EXAMINERS

- ALABAMA Montgomery, Oct 24-26 Sec, Dr B F. Austin, 519 Dexter Ave., Montgomery
- ARIZONA * Phoenix, Oct 34 Sec, Dr J H Patterson, 826 Security Bldg., Phoenix
- ARKANSAS * Little Rock, Nov 9-10 Sec, Dr D L Owens, Harrison
- COLORADO * Denver, Oct 3-6 Sec, Dr J B Davis, 331 Republic Bldg., Denver
- CONNECTICUT * Medical Written Hartford, Nov 14-15 Endorsement Hartford, Nov 28 Sec to the Board, Dr Creighton Barker, 258 Church St New Haven Homopathic Derby, Nov 14-15 Sec, Dr J H Evans Hartford 6
- DELAWARE Dover, Oct 10-12 Sec, Medical Council of Delaware, Dr J S McDanel, 229 S State St., Dover
- DISTRICT OF COLUMBIA * Washington, November Sec, Commission on Licensure, Dr G C Ruhland, 6150 E Municipal Bldg., Washington
- IDAHOO Boise, Jan 8-11 Dir, Bureau of Occupational Licenses, Mrs Lela D Painter, 355 State Capitol Bldg., Boise
- ILLINOIS Chicago Oct 10-12 Supt of Registration, Department of Registration and Education, Mr Philip Harman, Springfield
- INDIANA Indianapolis, Jan 3-5 Exec Sec, Board of Medical Registration and Examination, Miss Ruth V Kirk, 301 State House, Indianapolis 4
- IOWA * Iowa City, Sept 25-27 Dir Division of Licensure and Registration, Mr H W Grefe, Capitol Bldg., Des Moines
- KANSAS Nov 2-3 Sec, Board of Medical Registration and Examination, Dr J I Hassig, 905 N Seventh St Kansas City
- MAINE Portland, Nov 14-15 Sec, Board of Registration of Medicine, Dr A P Leighton, 192 State St., Portland
- MARYLAND Homopathic Baltimore, Dec 1-3 Sec, Dr John A Evans, 612 W 40th St., Baltimore
- MASSACHUSETTS Boston, Nov 14-17 Sec, Board of Registration in Medicine Dr H Q Gallupe, 413 F State House, Boston
- MICHIGAN * Detroit, Sept 25-27 Sec, Board of Registration in Medicine, Dr J E McIntyre, 100 W Allegan St., Lansing 8
- MISSISSIPPI Jackson, Oct 16-17 Asst Sec, Dr R N Whitfield Jackson
- MONTANA Helena, Oct 2-4 Sec, Dr O G Klein, First Natl Bank Bldg., Helena
- NEBRASKA * Omaha, Sept 26-28 Dir, Bureau of Examining Boards, Mr Oscar F Humble, 1009 State Capitol Bldg., Lincoln
- NEW JERSEY Trenton, Oct 17-18 Sec, Dr E S Hallinger, 28 W State St., Trenton
- NEW MEXICO * Santa Fe, Oct 9-10 Sec, Dr LeGrand Ward, 141 Palace Ave Santa Fe
- NEW YORK Albany, Buffalo, New York and Syracuse, Oct 16-19 Sec Dr R R Hannan Education Bldg Albany
- NORTH DAKOTA Grand Forks, Jan 2-5 Sec, Dr G M Williamson, 4½ S 3rd St., Grand Forks
- OHIO Examination Columbus, Sept 26-29 Endorsement Columbus, Oct 3-5 Sec, Dr H M Platter, 21 W Broad St Columbus
- PENNSYLVANIA Philadelphia and Pittsburgh Oct 3-6 Acting Sec, Bureau of Professional Licensing, Department of Public Instruction, Mrs Marguerite G Steiner 358 Education Bldg., Harrisburg
- RHODE ISLAND * Providence, Oct 5-6 Chief Division of Examiners, Mr Thomas B Casey, 366 State Office Bldg Providence
- SOUTH DAKOTA * Pierre Jan 16-17 Sec, Medical Licensure, State Board of Health, Dr G Cottam, Pierre
- TEXAS Dallas Nov 15-17 and Dec 19-21 Sec, Dr T J Crowe, 918 20 Texas Bank Bldg., Dallas 2
- WEST VIRGINIA Charleston, Oct 2-4 Commissioner, Public Health Council, Dr John E Offner, State Capitol Charleston 5
- WYOMING Cheyenne, Oct 2 Sec, Dr M C Keith, Capitol Bldg., Cheyenne

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

- CONNECTICUT New Haven, Oct 14 Address State Board of Healing Arts 250 Church Street, New Haven 10
- DISTRICT OF COLUMBIA Washington, Oct 23-24 Sec, Commission on Licensure, Dr G C Ruhland, 6150 E Municipal Bldg., Washington
- FLORIDA Gainesville, Nov 4 Final date for filing application is Oct 20 Sec, Dr J F Conn, John B Stetson University, DeLand
- IOWA Des Moines Oct 10 Dir Division of Licensure and Registration, Mr H W Grefe, Capitol Bldg., Des Moines
- MICHIGAN Ann Arbor and Detroit, Oct 13-14 Sec, Miss Eloise LeBeau 101 N Walnut St., Lansing
- MINNESOTA Minneapolis, Oct 3-4 Sec, Dr J C McKinley, 126 Willard Hall, University of Minnesota, Minneapolis 14
- NEBRASKA Omaha, Oct 3-4 Dir, Bureau of Examining Boards, Mr Oscar F Humble, 1009 State Capitol Bldg., Lincoln
- NEW MEXICO Santa Fe, Feb 12 Sec, Miss Marion M Rhea, State Capitol, Santa Fe
- OREGON Portland, Nov 4 Sec, Mr C D Byrne, University of Oregon, Eugene
- SOUTH DAKOTA Aberdeen, Dec 1-2 Sec, Dr G M Evans, Yankton
- TENNESSEE Memphis and Nashville, Sept 25-26 Sec, Dr O W Hyman, 874 University Ave., Memphis

**Bureau of Legal Medicine
and Legislation****MEDICOLEGAL ABSTRACTS**

Malpractice: Statute of Limitations Does Not Begin to Run Until Discovery of Negligence—In 1930 the plaintiff submitted to an abdominal operation in a hospital owned and operated by the Colorado Fuel and Iron Company. The operation was performed by two physician employees of the hospital, but whether the patient paid the hospital for their services or paid the physicians themselves directly the reported decision does not make clear. The patient suffered constant pain thereafter and was attended by various physicians. In October 1940 roentgenograms and fluoroscopes failed to indicate the presence of any foreign body in her abdomen, but a laparotomy performed later in the month revealed the presence in the abdomen of a large gauze pad, which the patient alleged was left there when the abdominal operation was performed. This, so the patient alleged, was the first notice that she had had that the physicians had been negligent in performing the abdominal operation in 1930. She sued the hospital, the two physicians who performed the operation in 1930 and a nurse who was in charge of the operating room at the time and assisted the two physicians in the operation. The nurse and the hospital moved to dismiss the action allegedly because the complaint failed to state a cause of action and because an applicable six year statute of limitations in Colorado barred suit. The defendant physicians moved to dismiss because of the bar of an applicable two year statute of limitations. The trial court dismissed the action with respect to all the defendants, and the patient appealed to the Supreme Court of Colorado.

The motion of the nurse, said the Supreme Court, was overruled by the trial court as to the contention that the complaint failed to state a cause of action against her but was sustained as to the contention that the applicable statute of limitations had run. We think the motion should have been sustained as to the first contention—namely, that the complaint stated no cause of action against her. It is not alleged in the complaint that the nurse was derelict as to any special duty with which she was charged, or that she was charged with any. According to the allegations of the complaint she was simply "assisting and surgeons" (referring to the physician defendants), and the presumption is that she was directed by them. Her negligence, if any, was that of the physicians or of the hospital.

The motion to dismiss filed by the hospital was sustained on the grounds that the complaint stated no cause of action against it and that the applicable statute of limitations had run. A hospital, a corporation as here, said the court cannot be licensed to and cannot practice medicine. The relation between physician and patient is personal. That a hospital employs physicians on its staff does not make it liable for the discharge of their professional duty since it is powerless under the law to command or forbid any act by them in the practice of their profession. Unless it employs those whose want of skill is known, or should be known, to it, or by some special conduct or neglect makes itself responsible for their malpractice (and no such allegation appears in the complaint in this case), it cannot be held liable therefor. Hence the motion of the hospital to dismiss because the complaint did not state a cause of action against it was properly sustained. Its motion to dismiss on the second ground, namely, that the applicable statute of limitations had run, becomes immaterial.

The motion of the two physicians to dismiss the complaint as to them was sustained by the trial court on the ground that the applicable two year statute of limitations had run. This, in the opinion of the court, was error. The statute on which the defendant physicians relied, so far as here applicable, reads

No person shall be permitted to maintain an action to recover damages from any person licensed to practice medicine on account of the alleged negligence of such person in the practice of the profession unless such action be instituted within two years after such cause of action accrued.

Much argument has been made, continued the court, on the question of whether it is the negligent act of the physicians or the resulting damage which fixed the date from which the statute of limitations begins to run. We ignore these arguments because that is not the point. The question here is: Does delay due to a patient's ignorance of the cause of a known injury stop the running of the statute when the patient has used every reasonable effort to ascertain the cause and has been frustrated solely by the concealment of the physicians concerned? In other words, under such circumstances, when did the cause of action accrue? There are certain recognized exceptions to the strict and literal construction of such statutes as that here in question, necessarily construed into them by the demands of simple justice and the necessity for evading constitutional conflicts. For instance, it would seem outrageous to deprive one of his right to sue when a superior law forbade suit, or require him to sue when good faith to his debtor forbade action. *Brooks v. Bates et al.*, 7 Colo. 576, 4 P. 1069; *Board of Com'rs of El Paso County v. Flanagan*, 21 Colo. App. 467, 122 P. 801. Do the facts before us constitute such an exception?

Cases involving the applicability of statutes similar to that here in question are numerous, the Supreme Court said, and not a few of them were actions against physicians for leaving a foreign substance in closed incisions. In most of these cases the exceptions are repudiated and the statute strictly construed. A shocking result of this doctrine is well illustrated by a New York case *Couklin v. Draper*, 229 App. Div. 227, 241 N. Y. S. 529; *Id.*, 254 N. Y. 620, 173 N. E. 892, in which a physician performed an appendectomy and left arterial forceps in the wound when it was closed. Despite allegations that he knew of his negligence but failed to disclose it and that plaintiff did everything within reason to discover the trouble and succeeded only when a roentgenogram revealed it and a hasty operation was performed to save life, a two year statute had run and its bar was sustained. A notable "gauze pad case" comes from Alabama, where it was contended that the statute was tolled since the cause of action was concealed by the negligence, hence the malfeasance should be treated as a fraudulent concealment. The strict construction rule was applied but the opinion does recognize the rule that one may not take advantage of his own wrong. A careful reading of the case discloses that the real basis of the decision was the absence of allegations of diligence on the part of the plaintiff to ascertain the cause of his ailment after the performance of the operation in question. *Hudson v. Moore*, 239 Ala. 130, 194 Co. 147.

It is generally held, continued the court, that fraudulent concealment stops the running of the statute. 74 A. L. R. 1320. It is said this is necessary that one be not permitted to take advantage of his own wrong. *Reynolds v. Hennessy*, 17 R. I. 169, 20 A. 307, 23 A. 639. But in such case the defendant has committed two wrongs, the original negligence and the fraudulent concealment. Why permit him to take advantage of the first and apply the rule only to the second? We are not impressed with the reasoning which supports the materiality of fraud. The statute of limitations is enacted to promote justice, discourage unnecessary delay and forestall the prosecution of stale claims, not for the benefit of the negligent. It should not be construed to defeat justice. The negligence is equally damaging and the victim equally helpless regardless of the motive for concealment. This statute has exactly the same effect, in the opinion of the court, as would a contract of employment which provided that no action could be maintained against the physicians unless brought within two years from the date of the performance of the operation; that is on a par with a contract of insurance providing no recovery can be had unless notice be given within a specified time. Any excuse which would defeat such express contracts is equally effective to toll the statute and it is well settled in this jurisdiction that impossibility to give notice is such. *London Guarantee & Accident Co. v. Officer*, 78 Colo. 441, 242 P. 989; *United States Casualty Co. v. Hanson*, 20 Colo. App. 393, 79 P. 176.

The court then discussed the decision of the Court of Appeals of Maryland in *Hahn v. Claybrook*, 130 Md. 179, 100 A. 83,

86, L. R. A. 1917C, 1169, which, after reviewing with apparent acquiescence various authorities which deny the exception or limit it to other grounds, appeared finally unable to escape the logic and justice of the rule that a patient's lack of knowledge, due to no lack of diligence on his part but solely to a physician defendant's concealment, tolls the statute, and held flatly that "the statute began to run from the time of the discovery of the alleged injury."

It has been held, continued the court, that while generally a plaintiff's ignorance of the wrong committed cannot be considered in determining when the statute begins to run, an exception to this rule is made in cases of the concealment of the cause of action. There the bar of the statute does not operate until discovery, and it is said "This proposition is so fundamental that no authorities need be cited." *Johnson v. Chicago, M. & St. P. R. Co.*, D. C., 224 F. 196, 201. With this statement we agree. Certainly one should not be permitted to take advantage of his own wrong. Under the facts pleaded it was impossible for plaintiff to sue within the limitation and it is a recognized maxim that the law does not require impossibilities. A legal right to damage for an injury is property, and one cannot be deprived of his property without due process. There can be no due process unless the party deprived has his day in court and if without his fault a tortfeasor conceals from him his right until a statute deprives him of his remedy he is deprived of due process. It is also an ancient maxim of the common law that "Where there is a right there is a remedy." What a mockery to say to one, grievously wronged, "Certainly you had a remedy, but while your debtor concealed from you the fact that you had a right the law stripped you of your remedy." Regardless of the number of authorities supporting the rule of strict construction, stated the Supreme Court, we disagree with them on reason and hold that this alleged cause of action against the physicians was not barred by the statute relied on.

For the reasons stated, the judgment of dismissal as to the physicians was reversed.—*Rosane v. Senger*, 149 P. (2d) 372 (Colo., 1944).

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 8-12. Dr. W. L. Benedict, 102 Second Ave. S.W., Rochester, Minn., Secretary.
- American Academy of Pediatrics, St. Louis, Nov. 9-11. Dr. Clifford G. Grulee, 636 Church St., St. Louis, Secretary.
- American Hospital Association, Chicago, Oct. 2-6. Mr. George P. Bugbee, 18 East L St., Chicago, Secretary.
- American Pediatric Association, St. Louis, Sept. 25-27. Dr. Hugh McCulloch, 325 N. Lucia Ave., St. Louis 8, Secretary.
- American Public Health Association, New York, Oct. 3-5. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, Executive Secretary.
- American Roentgen Ray Society, Chicago, Sept. 24-29. Dr. H. Dabney Kerr, University Hospitals, Iowa City, Secretary.
- Association of American Medical Colleges, Detroit, Oct. 23-25. Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary.
- Association of Military Surgeons of the United States, New York, Nov. 2-4. Col. James M. Phalen, Army Medical Museum, Washington 25, D. C., Secretary.
- Colorado State Medical Society, Denver, Sept. 27-29. Dr. John S. Bouslog, 537 Republic Bldg., Denver 2, Secretary.
- District of Columbia Medical Society of the United States, Washington, Oct. 5-7. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.
- Indiana State Medical Association, Indianapolis, Sept. 26-28. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis, Secretary.
- Inter-State Postgraduate Medical Association, Chicago, Oct. 17-20. Dr. Arthur G. Sullivan, 16 N. Carroll St., Madison, Wis., Managing Director.
- International College of Surgeons, U. S. Chapter, Philadelphia, Oct. 3-5. Dr. Desiderio Roman, 250 South 17th St., Philadelphia, Secretary.
- Kansas City Southwest Clinical Society, Kansas City, Mo., Oct. 2-4. Dr. William M. Korth, 1115 Grand Ave., Kansas City 6, Mo., Secretary.
- Michigan State Medical Society, Grand Rapids, Sept. 27-29. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Secretary.
- Midwestern Section of American Federation for Clinical Research, Chicago, Nov. 2. Dr. Richard H. Lyons, University Hospital, Ann Arbor, Mich., Secretary.
- Mississippi Valley Medical Society, Peoria, Ill., Sept. 27-28. Dr. Harold Swanberg, 510 Maine St., Quincy Ill., Secretary.
- Oklahoma City Clinical Society, Oklahoma City, Oct. 23-26. Dr. L. C. McHenry, 512 Medical Arts Bldg., Oklahoma City, Secretary.
- Omaha Mid-West Clinical Society, Omaha, Nebraska, Oct. 23-27. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha 2, Secretary.
- Radiological Society of North America, Chicago, Sept. 24-29. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Southern Medical Association, St. Louis, Mo., Nov. 13-16. Mr. C. P. Loran, Empire Building, Birmingham 3, Ala., Secretary.
- Virginia Medical Society of Richmond, Oct. 23-25. Miss Agnes V. Edwards, 1200 E. Clay St., Richmond 19, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

27:755-904 (June) 1944

Distribution of Potential of Ventricular Origin Below the Diaphragm and in Esophagus. J. D. Helm Jr., Grace H. Helm and C. C. Wolferth. p. 755.

Study of Methods of Making So-Called Unipolar Electrocardiograms. C. C. Wolferth and Mary M. Livezey.—p. 764.

Effects of Anterior Infarction Complicated by Bundle Branch Block on Form QRS Complex of Canine Electrocardiogram. F. F. Rosenbaum, H. Erlanger, N. Cotrim, F. D. Johnston and F. N. Wilson.—p. 783.

Coronary Occlusion, Coronary Insufficiency and Angina Pectoris: Clinical and Postmortem Study. A. M. Master, H. L. Jaffe, S. Dack and A. Grishman.—p. 803.

Electrocardiographic Changes in Uremia Associated with High Concentration of Serum Potassium: Report of 3 Cases. N. M. Keith, H. B. Burchell and A. H. Baggenstoss.—p. 817.

Continuous Intravenous Administration of Histamine: Effect on Electrocardiogram and Serum Potassium. G. A. Peters and B. T. Horton.—p. 845.

American J. Digestive Diseases, Fort Wayne, Ind.

11:205-240 (July) 1944

*Quantitative Study of Inhibitory Effect of Acid in Intestine on Gastric Secretion. I. J. Pincus, M. H. F. Friedman, J. E. Thomas and M. E. Rehfuess.—p. 205.

*Therapeutic Use of Amino Acid Histidine in Allergy and Shock—"Histidine as Factor in Histamine Epinephrine Balance." S. L. Ruskin.—p. 209.

Role of Fat Soluble Vitamins A and D in Nutrition: Requirements of Vitamin A. J. Buckstein.—p. 224.

New Test for Gastric Function. J. Nasio.—p. 227.

Effectiveness of Different Culture Mediums in Isolation of Enteric Micro-Organisms. E. R. Neter and Phyllis Clark.—p. 229.

Inhibitory Effect of Acid in Intestine on Gastric Secretion.—Pincus and his collaborators performed experiments on 3 dogs equipped with a Pavlov pouch of the stomach and on 1 dog with a Heidenhain pouch. They found that acid introduced into the small intestine of Pavlov pouch dogs inhibits gastric secretion in response to a meal, provided an adequate degree of intestinal acidity is attained. Great inhibition of secretion occurs if the pH of the intestinal contents is about 2.5 and almost complete depression when the pH is 2.0 or lower. The experiments point to the existence of a mechanism for the autoregulation of the gastric secretion which is brought into play when the acidity of the intestinal contents reaches levels which may be harmful to the intestinal mucosa. During the digestion of a meat meal by the dog the acidity of the duodenum near the pylorus is generally near pH 4, while the content of the antrum of the stomach has a reaction between pH 2.0 and pH 3.0. The existence of a threshold level of intestinal pH for inhibition of gastric secretion which these studies show to be within the pH range of the antral contents is suggestive. One of the authors has suggested that the "receptive relaxation" of the duodenum which occurs when the stomach empties itself results in the accumulation of duodenal contents in the vicinity of the pylorus. Occurring at the moment of exit of the acid gastric contents, this would facilitate quick dilution and partial neutralization of the chyme (to about pH 4.0). It may now be supposed that, should this neutralizing ability of the duodenal contents be ineffective, a second mechanism may be set into action, one which arrests the secretion of the acid at its source. The intestinal phase of digestion is believed to give rise to a corresponding intestinal phase of gastric secretion. The suggestion has been advanced that the intestinal phase of gastric secretion is normally regulated to some extent by the acidity

of the intestinal contents. The results obtained by the authors cast doubt on this assumption. In the dog, at least, little inhibition of acid secretion occurs if the intestinal pH is above 2.5. Acidities as great as this are rarely found in the dog's intestine. The authors regard this mechanism as one which is set into action only during emergencies when other means of reducing the acidity of the intestinal contents have failed. The possibility remains that in man the threshold is higher than pH 2.5, which would explain the results of Griffiths and Shay et al., who used less concentrated solutions of acid. The inhibition observed in these experiments may be due to enterogastone; the intestinal instillation of acid failed to inhibit the gastric secretion provoked by histamine.

Histidine in Allergy and Shock.—Ruskin experimented with a viable section of a bronchiole from rabbit lung obtained according to a slightly modified technic of Sollmann and Gilbert. The purpose of the experiment was to produce contraction of the bronchiole by adding histamine hydrochloride to the Ringer-Locke-dextrose solution to obtain a 1:50,000 concentration. After the contraction due to the histamine was established, and at a fixed interval, the substance to be tested for histamine antagonism was added. It was demonstrated that vitamin C has slight histamine antagonism in itself, but when serving as the acid radical for calcium, ephedrine, amphetamine or epinephrine it enhances their histamine antagonism and bronchiole dilating capacity. This is important in increasing respiratory ability. Calcium gluconate not only did not antagonize histamine hydrochloride but actually increased contraction of the bronchiole to the drug. Calcium ascorbate, on the other hand, antagonized histamine, and the response was quicker than that to either vitamin C alone or sodium ascorbate. This is significant in view of the conflicting claims made for calcium in the treatment of asthma. The synergistic effect of vitamin C on calcium may be the all deciding factor in the therapeutic value of calcium in allergy. Calcium gluconate may produce unfavorable results in the treatment of asthma, while calcium ascorbate may be useful. While amphetamine ascorbate produced a quick recovery from histamine contraction, with strong histamine block, the amphetamine sulfate showed no histamine antagonism and in fact prolonged histamine contraction. The implications of this experiment may be important in relation to histamine shock. While amphetamine sulfate can keep a soldier alert, it may predispose him to greater histamine shock, whereas the vitamin C salt may protect against histamine shock. The epinephrine ascorbate showed about twice the bronchiole dilating capacity exerted to epinephrine hydrochloride and a much quicker and more active histamine antagonism. The amino acids histidine and tyrosine, supplemented by methionine and choline, serve as fundamental factors in the balance between histamine and epinephrine. The author arrives at the following conclusions: (1) Therapeutic usefulness of the amino acid histidine is indicated in allergic and related conditions; (2) histidine is antagonistic to histamine and plays an important part in histamine-epinephrine balance in shock; (3) histidine produces a feeling of well being and energy that could be useful in the care of postoperative patients and the treatment of shock. Further study of histidine enrichment of parenterally administered protein hydrolysates as blood substitutes is being conducted.

Endocrinology, Springfield, Ill.

34:353-432 (June) 1944

Effect of Thyroid Treatment on Respiration of Various Rat Tissues. E. S. Gordon and A. E. Heming.—p. 353.

Diabetogenic Effect of Diethylstilbestrol in Adrenalectomized-Hypophysectomized-Partially Depancrectomized Rats. D. J. Ingles.—p. 361.

Removal of Exogenous Estrogens from Circulation. A. E. Rakoff, A. Cantarow, K. E. Paschke, L. P. Hansen and A. A. Walking.—p. 370.

Response of Intraocular Endometrial Implants to Estrogens in Female Rabbit. E. M. Jacobsen.—p. 376.

Deposition of Pigment in Sparrow's Hill in Response to Direct Applications as Specific and Quantitative Test for Androgen. C. A. Pfeiffer, C. W. Hooker and A. Kirschbaum.—p. 389.

Water Diuresis and Water Intoxication in Relation to Adrenal Cortex. R. Gaunt.—p. 400.

Influence of 11-Dehydro-17-Hydroxycorticosterone (Compound E) on Growth of Malignant Tumor in Mouse. F. R. Heilman and E. C. Kendall.—p. 416.

Florida Medical Association Journal, Jacksonville

31:1-40 (July) 1944

- Relationship of Obstructions to Urinary Affections E G Ballenger —p 13
* Rupture of Coronary Artery Report of Case with Necropsy M Dobrin —p 15
Collapse Therapy in Pulmonary Tuberculosis R D Thompson —p 16

Rupture of Coronary Artery—A man aged 74 was hospitalized with the complaint of tightness in the abdomen and shortness of breath. These symptoms came on gradually and grew worse. Six days previously he had been seized with a pain across the back which radiated up the neck to both jaws and down both arms, lasting ten minutes, four days before admission he had been kept awake most of the night with similar pains. The pulse could not be felt. The systolic blood pressure appeared to be about 50. Oxygen was administered and morphine was given twice during the night. The patient continued to have severe dyspnea and died the next morning. At necropsy the pericardial sac contained about 650 cc of liquid and clotted blood. On the anterior surface of the left ventricle, adjacent to the anterior descending branch of the left coronary artery there was an irregular tear in the epicardium with a small blood clot extruding. The coronary artery was sclerotic and calcareous, and there was a rupture of the artery with clotted blood in the opening. Dobrin states that the literature contains reports of only 33 cases of death due to rupture of a coronary artery.

Ohio State Medical Journal, Columbus

40:501-612 (June) 1944

- Radiology and Law S W Donaldson —p 517
Incidence of Hypothyroidism R M Watkins —p 521
Dark Adaptation in Skin Conditions J D Walters —p 524
Ruptured Dissecting Aneurysm Associated with Syphilitic Aortitis J C Sherrick —p 527
Recognition of Nonpollen Allergy of Respiratory Tract by General Practitioner R S Rosedale —p 529
Etiology of Regional Enteritis Role of Inflammatory Bands and Ileocecal Valve Incompetence J L DeConvey —p 533
* Case of Acute Leukemia Complicating Pregnancy With Necropsy Findings in Fetus H S Applebaum —p 536
Care of Crippled L H Wilson —p 539

Leukemia Complicating Pregnancy.—Applebaum reports a case in which myeloid leukemia developed during the first half of pregnancy. Three blood transfusions produced prompt but short lived improvement. A month later the woman, aged 29, was hospitalized again and was given x-ray treatments and blood transfusions, in spite of some improvement the course was steadily downhill. Since the patient would take no food, and nausea and vomiting became persistent, dextrose and saline solution together with amino acids were started intravenously, vitamins were given parenterally, all to no avail. A cesarean operation was performed in the hope of saving the child and giving some relief to the patient. The fetus was found dead, and the mother expired several hours later. Microscopic examination of the organs of the fetus revealed no leukemic infiltrations of the lymph nodes or spleen or of any of the 23 sections taken from the various organs. The absence of leukemia from the fetus is another link in the chain of evidence that 'a leukemic mother has never given birth to an infant with leukemia'. This suggests that leukemia in man is probably not transmitted by the mother to the child.

Pennsylvania Medical Journal, Harrisburg

47:961-1056 (July) 1944

- Evaluation of Kenny Method in Treatment of Chronic Infantile Paralysis B Chance Jr —p 975
Principles of Preparation for and Management of Elective Surgery in Children J A Cowan Jr —p 979
Continuous Fractional Spinal Anesthesia in Obstetrics and Gynecology Report of 308 Cases with Observations at Philadelphia Intra-Hospital Clinic —p 985
Treatment of Impaired Hearing by Radiation of Excessive Lymphoid Tissue in Nasopharynx H D Reutheiser and J W Settle Jr —p 985
Absence of Pain in Serious Urologic Disease D M Davis —p 989
Effect of Socialized Medicine on Workmen's Compensation and the Doctor in War F I Borzell —p 993

Public Health Reports, Washington, D. C.

59:765-796 (June 16) 1944

- Therapeutic Efficacy of Phenyl Arsenoxides in Mouse and Rabbit Trypanosomiasis (Tryp Equiperdum) H Eagle R B Hogan C O Doak and H G Steinman —p 765

59:797-828 (June 23) 1944

- Births, Infant Mortality and Maternal Mortality in United States—1942 I Yerushalmi —p 797

59:829-856 (June 30) 1944

- Sieve Device for Sampling Air Borne Micro Organisms H G DuBuy and I R Crisp —p 829
Production of Vitamin K Deficiency in Rats by Various Sulfonamides A Kornberg and W H Sebrell —p 837

Radiology, Syracuse, N. Y.

42:531-638 (June) 1944

- Cancer of Rectum N A McCormick —p 511
Clinical Features, Diagnosis and Treatment of Carcinoma of Colon and Rectum D S Beilin —p 539
Results of Treatment of 174 Cases of Carcinoma of Rectum M Malbin and K W Stenstrom —p 545
* Aseptic Necrosis in Adults Caisson Workers and Others H K Taylor —p 550
Right Aortic Arch, with Report of 8 Cases D Eisen —p 570
* Accidental Trauma and Tumor Metastasis B J Lech —p 579
Million Volt Isodose Curves for Angulated Beams M C Reinhard and H I Goltz —p 591

Aseptic Necrosis in Caisson Workers and Others.—Taylor observed 54 persons showing aseptic necrosis and bone infarcts. Of the 13 patients who had worked under compressed air for varying periods of time some were subjected to sudden changes of atmospheric pressure and had experienced symptoms of acroembolism decompression illness or bends. Others were not subjected to sudden changes in atmospheric pressure. Of the latter group some had mild or subacute symptoms of decompression illness and others did not. Shaft and joint lesions do not develop immediately after decompression illness. Considerable time must elapse. The shaft lesions are usually asymptomatic and are discovered accidentally. In the joints secondary arthritic changes occur resembling a chronic hypertrophic osteoarthritis. The lesions observed in the 41 patients who had never worked under compressed air and had never been subjected to sudden or violent changes in atmospheric pressure were similar to those in the occupational group. In the caisson worker the etiologic factor is the presence of an inert gas, nitrogen, in bubble formation either forming an embolus or producing pressure or both, thus interfering with the circulation to the part. In the noncaisson worker there is no apparent etiologic factor. The bone lesions may be single, though usually they are multiple and often bilateral. Caisson workers presented extensive and multiple lesions more often than others. In the noncaisson worker, in whom the lesion is single and not extensive, the reparative changes are usually greater. Deep scuba divers and aviators may develop acroembolism. There are, however, no recorded evidences of bone changes in either naval or air personnel who have had attacks of acroembolism.

Accidental Trauma and Tumor Metastasis.—Loth presents 2 cases of generalized carcinomatosis which were studied with a view of determining the influence of mechanical injuries on the formation of metastases. He lists the requirements that, according to Second Thiem, Lubarsch and Kwang should be fulfilled to establish a relationship between injury and tumor. He evaluates his 2 cases with these requirements in mind. Lacerations of the skin, repeated subcutaneous and intravenous injections, surgical amputation of the forearm, and linear as well as compression fractures failed to result in the localization of secondary tumors. One post-traumatic and several supposedly post-traumatic metastases seemingly fulfilled all the requirements of Second for the establishment of a definite relationship between accidental injury and metastatic cancer. On further observation, however, it became evident that this patient had an unusual type of metastatic spread from a primary lung carcinoma with preferential involvement of the subcutaneous tissues and muscles. The practically identical appearance of several intramuscular and subcutaneous metastases was evidence against a traumatic influence. A subsequent experimental blunt traumatization affecting mainly the subcutaneous structures in an apparently favorable location failed to result in the formation of a metas-

tasis It thus appears that the unknown laws of metastasis have had an overwhelming—probably an exclusive—influence in the localization of the secondary deposits, possibly being entirely indifferent to the incidental presence of multiple traumas The author suggests that in cases which are doubtful from the medicolegal point of view a further requirement should be added to the usual postulates of Segond and others

Southern Medical Journal, Birmingham, Ala.

37:365-414 (July) 1944

- *Deaths from Sulfonamides Clinical and Pathological Study, with Report of 3 Cases C N Gessler—p 365
- *Clinical Analysis of 1,000 Consecutive Cases of Low Back Pain, with Particular Reference to Sciatic Pain Caused by Extrusion of Intervertebral Disk F Jelsma—p 372
- Practical Application of Physical Therapy in Medicine W J Zeiter—p 378
- Problem of Benign Prostate E O Swartz—p 382
- Menstrual Irregularity W Bickers—p 391
- Radium Treatment of Nasopharyngeal Lymphoid Hypertrophy R E Fricke and H A Brown—p 399
- Some of Detoxifying Properties of Heparin D I Macht—p 402
- Study of Incidence and Treatment of Intestinal Parasites in South eastern Kentucky W C Bailey—p 407

Deaths from Sulfonamides.—Gessler studied tissues from 3 patients in whom death is believed to have been caused by sulfonamide administration The major cause of death in all 3 cases was uremia, but in 1 case a previously undescribed type of pulmonary pathology was believed to be an important factor In 2 cases sulfathiazole was the drug used, in the third case sulfadiazine was used The author presents clinical histories, postmortem observations and the results of microscopic studies In 1 case, in addition to tubular nephritis, myocarditis and visceral focal necrosis, a previously undescribed interstitial pneumonitis with hyaline membrane formation was found The author reviews 30 cases from the literature In these sulfathiazole was the incriminated medication 16 times, sulfadiazine 5 times, sulfapyridine 6 times and sulfanilamide 3 times Anuria was the complicating factor in 18 cases, the majority of which were treated with sulfathiazole Agranulocytosis was the complicating factor 5 times, agranulocytosis was not found in sulfadiazine treated cases Hemolytic anemia was the complicating factor once, sulfanilamide was used then In the other 6 cases death was not due to drug intoxication, but signs of drug intoxication were incidental findings of the necropsy The urinary tract was blocked by concretions of the drug in 3 cases, a different drug was used in each of these cases In 11 cases there were evidences which suggested that there might be a blocked urinary tract, most of these were in sulfathiazole treated cases Uremia and agranulocytosis are the most frequent lethal complications The mechanism by which the sulfonamides cause toxic symptoms has not been completely explained There are many uncorrelated facts which require further study It seems likely that many of the minor reactions—nausea dizziness, disorientation, headaches—may be due to the allergic or pharmacologic reactions, kidney damage and hematuria are apparently due more often to mechanical factors Focal necrosis, agranulocytosis and periarteritis nodosa may be due to a combination of these factors Although most physicians view with alarm the appearance of one or more of the minor reactions while patients are receiving sulfonamides, there is little evidence to suggest that the minor reactions are precursors of the more serious reactions

Clinical Analysis of 1,000 Cases of Low Back Pain.—The scope of this paper by Jelsma is limited to the consideration of those cases in which pain is complained of in the lower lumbar region especially with distribution of pain along the sciatic nerve A total of 531 of the patients had sufficient clinical signs and symptoms to warrant the assumption that a focal neurologic lesion was present It was found that 484 of these 531 patients had clinical signs to warrant the diagnosis of probable herniated disk Of the remaining 47 patients with symptoms of neurologic focal lesions 10 had crushing of one or more of the lumbar vertebrae, 10 had a metastasis to the lumbar spine, 9 had primary intradural tumors 9 had spina bifida occulta, 4 had spondylolisthesis, 4 had sacralization of the fifth lumbar vertebra and in 1 patient the symptoms were due to an arachnoid cyst In many of the 469 cases in which focal neuro-

logic signs could not be found the pain was apparently due to hypertrophic arthritic changes In view of the abundance of nerve endings found in the posterior longitudinal ligaments, it has been suggested that the cause for many low back pains, without other evident causes, is due to involvement of the disks without protrusion and without compression of the spinal nerves McKenzie feels that destructive processes of the disks (traumatic or otherwise) can produce such pains This group of patients was treated with palliative measures Palliative measures were used for all patients with herniated disk as long as it gave improvement The surgical mortality rate was zero

Surgery, St. Louis

15:869-1036 (June) 1944

- Observations on Battle Fractures of Extremities O P Hampton Jr and J M Parker—p 869
- Fractures of Femur Results of Treatment Over Period of Six Years at Mayo Clinic R K Ghormley, G S Phalen, R E VanDemark and C A Luckey—p 887
- Traumatic Synostosis of Distal Third of Radius and Ulna F Hurt and S C Ho—p 894
- *Studies on Burns I Effect of Plaster Confinement Applied at Varying Intervals After Burning E M Alrich and E P Lehman—p 899
- *Id II Observations on Vasoconstrictor Substance in Lymph from Burned Area E M Alrich—p 908
- Cotton as Suture Material E O Latimer—p 913
- Surgical Treatment of Carcinoma of Common Bile Duct K L Pickrell and A Bhlock—p 923
- *Gynecomastia with Report of 7 Cases E F Goebel—p 938
- Carcinoma of Breast Comparative Clinical and Pathologic Study of Tumors Metastasizing to Bone and to Viscera T A Paletti and E P Lehman—p 944
- Experimental Esophagectomy O Swenson and T V Magruder Jr—p 954
- Congenital Macroglossia (Fibromatosis Gingivae) and Hypertrichosis L T Byars and B G Sarnat—p 964
- Urinary Infection After Colostomy H Milwidsky and T Mandl—p 971
- Rectal and Colonic Complications of Pelvic Irradiation H J Kallet and M J Thorstad—p 980
- Report of Case of Retroperitoneal Hemangioperithelioma T J Snodgrass—p 988
- Foreign Body in Thyroid Gland Case Report H T Wible and T Spellman—p 994

Effect of Plaster Confinement Applied at Varying Intervals After Burning.—Alrich and Lehman made studies on dogs to determine the effects of plaster confinement applied at varying intervals following a standard burn on the composition of the circulating blood and lymph from the burned area Data were also obtained on the local effects of this form of treatment It is important to distinguish between plaster confinement of a burn and pressure dressing It is conceivable that pressure dressings applied late might be effective in returning some of the extravasated plasma to the blood stream, a result not to be anticipated with simple confining dressings The experiments tend to substantiate the hypothesis that confinement of a burn in a cast protects the circulating blood volume They also suggest that the time of application of the confining dressing is of major importance From the point of view of preventing plasma loss this type of dressing, therefore, is not perfectly adapted to the care of clinical burns that are treated more than an hour or so after injury Since, however, there is evidence that local tissue loss is decreased, the use of this treatment is not contraindicated Whether or not pressure dressings, in contradistinction to simple confining dressings, are effective in returning already extravasated plasma to the circulation is not shown by this study

Vasoconstrictor Substance in Lymph from a Burned Area.—This study by Alrich offers evidence of the existence of a vasoconstrictor substance in the lymph from a burned area Dogs under usual laboratory conditions were employed, divided into control and experimental animals The latter were subjected under pentothal sodium anesthesia to a standard hot water burn of a paw according to the method of Glenn, Peterson and Drinker In both groups a lymph vessel leading from the paw was cannulated and samples of lymph heparinized as the fluid entered the cannula, were collected In the burned animals the lymph flow was spontaneous, in the control animals mechanically effected passive motion of the paw was necessary to obtain adequate samples Hourly samples of lymph were obtained for study and were passed through the perfused rabbits ear in varying amounts The presence of a vasoconstricting substance was indicated by a decrease in the electrically recorded drop

rate from the ear vein. Since vasoconstrictor substances are developed in the process of coagulation, both the control and the experimental observations were carried out on previously heparinized as well as on normal dogs. The reported experiments give evidence of a vasoconstricting substance in the lymph from an experimentally burned area. It is not due to the process of coagulation, since it is present when previously heparinized animals are employed. It is possible that this is the constrictor substance observed in the circulating blood by Page. The substance has not been identified nor its relation to a supposed "burn toxemia" established.

Gynecomastia.—Seven cases of gynecomastia, are reviewed by Goel. Endocrine influences and trauma are probable etiologic factors. Only 1 patient presented any semblance of endocrine dyscrasia. Three patients in this series mentioned the possibility of trauma when questioned closely, but only 1 was definite. Gynecomastia may be confused clinically with chronic mastitis. It is difficult to predict preoperatively exactly what pathologic change has occurred. Gynecomastia may be underlying, but mastitis or neoplasm may be contributory. Metaplasia in an intraductal papilloma was found in 1 case in this series. All patients in this series were treated by mastectomy. All were healed and ready for full duty in from ten days to three weeks. The surgical approach was through a slightly curved, transverse incision made just inferior to the areola. This permitted easy dissection of the areola and nipple from the breast without injury, offered approach to all portions of the breast including the axillary prolongation and permitted a cosmetically desirable closure without distortion of the areola. The entire breast was excised. This apparently is important, since only a portion of the left breast in 1 case had been removed at the first operation, following which symptoms continued.

United States Naval Med. Bulletin, Washington, D. C.

43:1-208 (July) 1944. Partial Index

- Rheumatic Fever and Acute Arthritis as Causes for Evacuation from South Pacific Area. H. B. Sprague and S. McGinn.—p. 1.
Infectious Polyneuritis: Report of 4 Cases. A. W. Stearns and H. I. Harris.—p. 13.
Dermatologic Practice in the South Pacific: Review of 1,500 Cases. C. T. Bingham and R. L. Macke.—p. 17.
Factors in Efficient Mass Blood Procurement. K. P. A. Taylor.—p. 25.
Airsickness. R. G. Witwer.—p. 34.
Ultraviolet Irradiation Relative to Anoxia and Bend Susceptibility: Preliminary Investigation. W. M. Davidson.—p. 37.
Experiment in Psychotherapy During Selection Examining. J. H. Closson and H. M. Hildreth.—p. 39.
Changing Picture of Postpneumonic Empyema Thoracis Complicating Sulfonamide Treated Pneumonia. C. D. Benson and C. W. McLaughlin Jr.—p. 46.
Knee Injuries in Service Personnel. J. H. Allan and J. T. Nicholson.—p. 63.
Surgical Casualties of Amphibious Warfare. L. K. Ferguson.—p. 73.
Renourteral Colic in South Pacific Area. M. Glazier and C. Olson.—p. 80.
*Autoplastic Sutures in Repair of Inguinal Hernia. G. G. Chiles and H. F. Lenhardt.—p. 83.
*Temporary Stimulation of Emmetropic Visual Acuity. J. E. Lebensohn and R. R. Sullivan.—p. 90.
Cosmetic Ocular Rehabilitation. M. J. Blaess.—p. 96.
Application of Caudal Anesthesia to General Surgery. W. M. Russell and J. E. Conley.—p. 100.
Anesthesia in Military Medicine: Administration by Unskilled. M. B. Genauer.—p. 105.
Procaine Hydrochloride 4 per cent: Indications for Use. J. C. Farquhar.—p. 111.
Analysis of Low Incidence of Infectious Diseases at Secondary Training Center. W. V. Lulow and H. B. Benjamin.—p. 114.

Autoplastic Sutures in Inguinal Hernia.—Chiles and Lenhardt point out that the use of fascial strips for the repair of inguinal hernia was advocated more than four decades ago by McArthur. The type of hernia repair advocated in this paper is based on the technic of Robins, who in 1938 reported his results with the use of autoplastic sutures in hernia repair. The authors describe the operative technic and stress the following points: 1. The careful separation and identification of the various abdominal layers will not only facilitate the operation but also allow the structures to fall into their new relationship after suturing. 2. Fascial sutures are resistant to infection; they do not tear and are not absorbed. 3. The stress or strain is not all on the terminal end of the suture, but it is applied

after the principle of a windlass, being equally distributed throughout the course of the suture. 4. The existing pathologic condition should be the guide as to the type of repair to be used. 5. When for any reason the external oblique muscle is inadequate, the fascia can be secured from the fascia lata of the leg by the use of a Masson stripper.

Temporary Stimulation of Emmetropic Visual Acuity.—Lebensohn and Sullivan say that visuopsychic excitation seems to be the only factor common to the procedures recommended for improving natural vision. An increase of interest, attention and alertness effects keener interpretation of visuosensory stimuli. Drugs that accelerate cortical or sympathetic activity should be effective. This view is supported by recent experiments on one of the fundamental measurements of visual function, the fusion frequency of flicker, which is indicative of the excitability of the visual system. An increase of acuity above that attainable by a careful refraction would emphasize how much the psychic cortex participates in visual acuity measurements. Fifty men were selected for study whose visual acuity in each eye was 20/20 or better, naturally or with glasses. Acuity was tested on the double broken circles of the Ferree-Rand chart. From a stop watch record of the ten letter reading, the speed per letter in tenths of a second was noted and the average of three trials recorded. In every subject the eyes were examined separately and binocularly, so that each examination involved three tests for speed and acuity respectively. Each man was tested at 8 a. m. and was then given a placebo as a control or 10 mg. of amphetamine or 3 cc. of nikethamide, and the tests were repeated at 10 a. m. and 2 p. m. A consistent improvement in acuity and reading speed was induced by nikethamide and amphetamine in both slow and fast readers. Nikethamide or amphetamine improves reading speed more than visual acuity, but the effect of amphetamine on both visual functions is more pronounced than the effect of nikethamide. Analysis of 150 tests shows that in 44 cases amphetamine was relatively superior to nikethamide in stimulating visual acuity and in 126 cases in increasing reading speed. Amphetamine apparently exerts a more beneficial influence on normal than on ametropic vision. This was proved by comparative tests on 16 persons with ametropia. The authors conclude that the psychogenic origin of many visual complaints is probably insufficiently appreciated. The visuopsychic cortex can be stimulated by various measures, but amphetamine in small doses (from 5 to 10 mg.) is a simple, safe and efficient agent for this purpose.

Virginia Medical Monthly, Richmond

71:339-394 (July) 1944

- Plastic Surgery of Severe Burns. E. I. Evans and T. J. Alm.—p. 342.
Demerol—Substitute for Morphine in Surgical Practice. C. S. White.—p. 351.
Recent Progress in Physical Medicine. R. Kovacs.—p. 354.
Case of Syphilitic Paralysis Cured by Fever. J. O. Fitzgerald Jr.—p. 359.
Treatment of Certain Mental Disorders by Psychosurgery. R. F. Gayle Jr. and C. L. Neale.—p. 361.
Maternal Mortality Situation. C. J. Andrews.—p. 366.
Nutritional Activities of Virginia State Department of Health. H. H. Henderson, A. L. Carson Jr. and J. B. Porterfield.—p. 371.
Nutrition from Doctor's Point of View. W. Wilkins.—p. 374.
Sun and Heat Disease. G. T. Grinnan.—p. 380.

War Medicine, Chicago

5:349-432 (June) 1944

- Nutritional Disorders in Japanese Internment Camps. W. H. Adolph, A. V. Greaves, Josephine C. Lawney and H. L. Robinson.—p. 349.
Infectious Mononucleosis in Army. R. H. Mitchell and L. Zetzel.—p. 356.
Constitutional Pathologic State and Military Fitness. J. C. Rheingold.—p. 361.
Herniation of Muscles of Legs. H. C. Goldberg and G. W. Comstock.—p. 365.
Sodium Amytal Narcosis in Treatment of Operational Fatigue in Combat Aircrews. D. W. Hastings, B. C. Glueck and D. G. Wright.—p. 368.
Special Aspects of Procedures and Organization for Induction and Discharge in Canadian Army. L. S. Kubie.—p. 373.
Clinical Features and Diagnosis of Malingering in Military Personnel: Use of Barbiturate Narcosis as Aid in Detection. A. O. Ludwig.—p. 378.
Massive Craniocerebral Trauma from Airplane Propeller: Report of Case with Recovery. J. D. O'Connor.—p. 383.
Ancylostomiasis Associated with Hematuria. H. Davis.—p. 385.

Book Notices

Intravenous Anesthesia. By R. Charles Adams, M.D., C.M., M.S., Associate in Section on Anesthesiology, Mayo Clinic, Rochester, Minnesota. Cloth. Price, \$12. Pp. 663, with 75 illustrations. New York & London: Paul B. Hoeber, Inc., 1944.

This monograph covers the development of intravenous anesthesia from 1872 until the present time. It includes chapters on chloral hydrate, hedonal, ether, isopral, paraldehyde, magnesium sulfate, morphine, alcohol, tribromoethanol, somnifene, local anesthetics, allylisopropyl barbituric acid (alurate), phenobarbital sodium, dial, pernoston, sodium amytal, pentobarbital sodium, evipal soluble, pentothal sodium, miscellaneous derivatives of barbituric acid and analeptics. Each of these subjects is introduced by a concise consideration of the historical data. This is followed by a consideration of the chemistry, pharmacologic action and clinical use. So completely is each subject treated that the book will be very useful for clinicians and teachers. A practically complete bibliography of references (3,489) makes this book valuable for research workers.

Much effort was expended by the author and those who assisted him in clarifying the confusion which has existed regarding the names of the many derivatives of barbituric acid. To the anesthetist the value of this book is apparent. General practitioners, who use intravenous anesthesia only occasionally, can quickly obtain information about the action, the dangers, the dose and the method of administration of the drugs that are used for this purpose. An exhaustive consideration of pentothal sodium, which is at the present time the most useful and available of the derivatives of barbituric acid for intravenous use, is presented. The concluding chapter, on "Use of Intravenous Anesthesia and the Barbiturates in Military Surgery," indicates the timeliness of the book.

Commendation of the author for the great effort which obviously was made in compiling this book, as well as its recommendation to all persons who have occasion to use or to study the drugs which are used intravenously is made after reading this valuable work, which is very well done.

Fractures and Joint Injuries. By R. Watson-Jones, B.Sc., M.Ch.Orth., F.R.C.S., Consultant in Orthopedic Surgery to the Royal Air Force. Volumes I and II. Third edition. Cloth. Price, \$18 per set. Pp. 407; 409-960, with 1,353 illustrations. Baltimore: William Wood & Company, 1943.

Mr. Jones is civilian consultant to the Royal Air Force on fractures and dislocations. He travels from one end of the British Isles to the other by air, by train, by bus, setting up fracture hospitals for R. A. F. fliers. He not only sets up the hospital but consults with the local hospital surgeons regarding treatment. He personally supervises and operates in some of the difficult cases. Mr. Jones is well known in the United States and Canada. He is especially well known to orthopedic surgeons and to traumatic surgeons, especially those who deal with fractures and dislocations. Because of the large number of additions, this edition has been published in two volumes. More books like this are needed; that is, books that are based on (1) large experience, (2) careful study of the subject and (3) good judgment not only in diagnosis but in treatment.

The material is well selected, the composition is excellent and the sequence is proper. The illustrations consist of line drawings, photographs, x-ray reproductions, diagrams, color figures and "peep" illustrations. "Peep" illustrations are those which permit the reader to make a diagnosis from the illustration and then flip a flap covering another nearby illustration, thereby uncovering the correct diagnosis. Many of the diagrams, such as those illustrating blood supply to various sections of bones, such as the ankle bones and the leg bones, are in color.

There are many excellent features in the book, from the standpoint both of basic principles of diagnosis and treatment and from that of specific diagnosis and treatment. (Some will consider Jones radical in several instances.)

The author states that the first edition of his book on fractures and joint injuries was written under the threat of war, the second with the realization of war and the third after the experience of war. The writing of many pages has been disturbed by the fall of bombs and the crash of timber. Manu-

script has been destroyed by the effect of fire and explosion. His proofs have been delayed by the emergency of casualty surgery.

The author has had a tremendous experience. In former editions he stated that he had experience with nearly 50,000 civilian casualties, for example in the first two years of the war 75 cases of dislocation of the astragalus have occurred in the Royal Air Force Medical Service.

Every chapter has been revised, new sections have been added on open and infected fractures, war wounds, sequestrectomy, vascular injuries, immersion foot and shelter foot, traumatic edema and the crush syndrome, gangrene due to tourniquets, Volkmann's ischemic contracture, traumatic asphyxia and chest injuries, avascular necrosis of the hip joint, distraction of fractures, radiographic diagnosis of union, internal fixation of fractures, no-touch technic, treatment by lay-on grafting, burns and contractures of the hand. New recommendations have been made in the treatment of supraspinatus tendon injury, and various fractures and dislocations of the upper extremities. He describes methods of treatment for acromioclavicular dislocation and supracondylar fracture of the femur. The author is very strong for rehabilitation centers. It is evident that rehabilitation is the watchword of the hour. Treatment is concentrated not only on the union of fractures but on the function of limbs, not only on surgery and manipulation but on gymnastics and recreation, not only on the relief of disability but on the cure of psychologic disorders. This is the most striking development of fracture treatment in recent years, and a special chapter is devoted to its consideration. The new addition has over 200 more pages than the early editions and therefore was published in two volumes. The expansion is due largely to added roentgenograms, diagrams and photographs. There is one interesting quotation which reads "My story is not long but it took me a long time to make it short," credited to Thoreau. Jones emphasizes the fact that a fracture is not to be labeled ununited simply because union is incomplete in a specific number of weeks or months. He emphasizes the prevention of edema of the leg.

One of the striking features of the book is the chapter on vascular injuries complicating wounds and fractures. Another section of importance is on the danger of x-rays to surgeons. He recommends the use of Unna's paste dressing to prevent edema after the removal of a plaster of paris cast of the leg. There is a good section on the complications of plaster immobilization. There is another on the indications for operative reduction. The second on scrupulous aseptic technic is well worth reading. There is an excellent section on open and infected fractures in war wounds. Over 40,000 amputations were performed in England during the last war and during the few years immediately following. Since then tremendous strides have been made in the surgery of wounds in compound fractures, and amputations are becoming increasingly rare. For example, in one large series of casualties treated in R. A. F. base hospitals, the incidence of secondary amputation or spreading infection, gas gangrene, secondary hemorrhage and other complications was as low as 0.1 per cent despite a high proportion of severely infected and grossly contaminated wounds and compound fractures.

There is a large number of references, and it is remarkable how many of Mr. Jones's own contributions have been made to the subject at hand.

Cancer: A Manual for Physicians. Published jointly by Michigan State Medical Society and Michigan Department of Health. Cloth. Pp. 225. Lansing, 1941.

This book is written by members of the Michigan State Medical Society under the editorship of its cancer committee. The Michigan Department of Health contributed toward the expenses of publication. Like that of similar books in other states, its purpose is to "assist the physician in making his diagnosis of early cancer and in reaching his decision as to the type of therapy to be employed, without subjecting the patient to the dangerous delay that sometimes occurs." There are forty-four unsigned articles by thirty-eight authors. These articles deal with the general and special aspects of cancer, including tumors of the brain and of bones. The articles are

of course short but as a rule cover their topics well. The articles on biopsy in tumor diagnosis and on radiotherapy of cancer are especially praiseworthy. The statement about grading of cancer in the first of these articles merits quotation: "Many physicians attach far too much importance to the numerical grade of neoplasms. It must be kept in mind that the grade is assigned by the pathologist only in accordance with his impression of the level of differentiation. By itself, the grade tells nothing about the clinical state of the patient, nor does it indicate the prognosis. A grade 1 carcinoma may have been present for many years and may have spread widely by both infiltration and metastasis. It may still be grade 1 when the patient is about to die from its effects. Conversely, a grade 4 carcinoma may be so early and so small that the patient can be cured by a single sweep of a curet. Type of neoplasm, location, extent, duration and metastasis, as well as grade, determine the prognosis." It may be mentioned also that the fundamental principles of treatment remain the same whatever the grade. The article on carcinoma of the larynx is utterly inadequate, because it does not even mention its treatment with external radiation, which is now the treatment of choice of certain forms of laryngeal cancer. There are instructive articles on occupational cancer, on tumors of the endocrine glands, on the care of the patient with advanced cancer, on the Michigan program, on lay education and on cancer from the general practitioner's point of view. "The most worthwhile service the general practitioner can render his patients who may have cancer is in prompt initiation of the processes through which they will obtain the best diagnostic and therapeutic services possible."

The Compleat Pediatrician: Practical, Diagnostic, Therapeutic and Preventive Pediatrics for the Use of Medical Students, Internes, General Practitioners, and Pediatricians. By Wilburt C. Davison, M.A., D.Sc., M.D., Professor of Pediatrics, Duke University School of Medicine, Durham, North Carolina. (Adaptation of the Title Page of the Compleat Angler by Izaak Walton, 1653.) Fourth edition. Cloth. Price, \$3.75. Pp. 256. Durham: Duke University Press, 1943.

Few books on pediatrics have had the widespread acceptance as *The Compleat Pediatrician*. The fourth edition of this excellent guide and compilation of pediatric facts is current and well edited. Practically all important contributions to the field of pediatrics since the text was last revised three years ago are included in the present edition. Sections on chemotherapy, tropical diseases and infectious diseases have received particular attention, but almost every part of the book has been brought into line with recent work. The book has always enjoyed a merited reputation for its vast amount of practical pediatric facts in the most concise and readable form. Few books dealing with pediatrics are as current and as well edited. Practitioners have always shown a preference for the previous editions, and it has served them well in their practical work. The last few editions have found an increasing acceptance among medical students, who have found it invaluable on their pediatric clerkships. The author's extensive experience as scientist, clinician and educator is reflected in its pages, and few books on pediatrics are as authoritatively edited and as convincingly presented.

Polish School of Medicine at the University of Edinburgh. Editor: Józef Brodzki. Cloth. Pp. 62, with 24 illustrations. London & Edinburgh: Oliver and Boyd, Ltd., 1942.

This little volume tells the exciting story of a unique event in scientific history. Never before has any state set up its own medical school with its own professors teaching its own students in their native tongue on foreign soil and as a part of a foreign university. A considerable part of the Polish army was evacuated to Great Britain on the fall of France in June 1940. Included were several hundred medical officers, among whom were teachers, physicians and scientists of high professional standing. There were also numbers of recent medical graduates and men who had completed part of their medical training in Poland. The University of Edinburgh magnanimously offered its facilities, the Polish government in exile provided financial support and the Polish School of Medicine at the University of Edinburgh was organized. It opened its doors to Polish men and women, officers and civilians, March 22, 1941. Facilities provided by the University of Edinburgh

include the use of lecture theaters, tutorial rooms, hospital wards, laboratories, instruments and reagents, microscopes, specimens, slides and films. The faculty includes fourteen former professors in Polish medical schools in addition to ten physicians without former academic connections. During the first year of operation there were seventy-nine students at various academic levels. Medical degrees were conferred on nineteen students during the second academic session. The faculty has contributed to scientific meetings and has published significant scientific articles on the basis of investigations conducted at the new school. This school represents not only the true international spirit of medicine but also the courage and persistence of Polish medicine and education and will provide an important beginning for the rebirth of medicine in Poland, which has now been reduced by the Germans to an "intellectual desert."

Human Constitution in Clinical Medicine. By George Draper, M.D., Associate Professor of Clinical Medicine, College of Physicians and Surgeons, Columbia University, New York, C. W. Dupertuis, Ph.D., Physical Anthropologist, Constitution Clinic, Presbyterian Hospital, New York, and J. L. Caughey Jr., M.D., Med.Sc.D., Associate in Medicine, College of Physicians and Surgeons, Columbia University. Cloth. Price, \$4. Pp. 273, with 29 illustrations. New York & London: Paul B. Hoeber, Inc., 1944.

This book is designed primarily for students, to give them an insight into the human constitution as it plays a role in clinical medicine. However, the practitioner will find it exceedingly interesting even though he will have to review some of his basic sciences to understand much of the discussion. From the cultural point of view it is a healthy addition to medical literature, but from a practical standpoint one seriously questions the need for such exact measurements of a group of patients with pernicious anemia, duodenal ulcer, acute rheumatic fever, migraine, toxemia of pregnancy, gallbladder disease, carcinoma of the breast and carcinoma of the uterus. It is hoped that the authors in teaching this material to their students do not hold them too strictly accountable for the details of the textbook but teach the course with the distinct impression that it is something they have been vitally interested in, and they are now happy to give to their students and the medical profession a field in which they have had an interest.

Secretory Mechanism of the Digestive Glands. By B. P. Babkin, M.D., D.Sc., LL.D., Research Professor of Physiology, McGill University, Montreal, Canada. Cloth. Price, \$12.75. Pp. 900, with 220 illustrations. New York & London: Paul B. Hoeber, Inc., 1944.

All students of gastroenterology are familiar with "The External Secretions of the Digestive Glands," written in lucid German and extraordinarily well documented by Dr. Babkin. The present volume constitutes another important contribution to gastroenterology. The subject matter deals principally with the mechanisms which are concerned in the regulation of the secretory activity of the digestive glands. It does not cover the older literature, which was adequately covered in the preceding book. It presents a critical review and summary of the work done since 1929 by the author and his students and the contemporary work of other investigators in the field. However, adequate reference to older work and comprehensive reviews is not lacking. A copy of this book should be in every medical library, and graduate students in the field of digestion will have to use it and will be thankful for having it available. Dr. Babkin and the publishers in providing this volume have rendered a definite service to physiology and medicine.

Occupation and Health: Encyclopaedia of Hygiene, Pathology and Social Welfare, Studied from the Point of View of Labour, Industry and Trades. Special Supplement: Industrial Health in Wartime. Paper. Price, 25 cents; 1s. Pp. 39. Montreal: International Labour Office, 1944.

Industrial Health in Wartime reviews recent pertinent literature under headings of silicosis, metal poisoning, insecticides and fumigants, carbon monoxide, carbon disulfide, benzene and its homologues, explosives, rubber, chlorinated naphthalenes and diphenyls, radioactive luminous paints and x-rays, toxic limits, caisson sickness, hygiene in aviation and skin diseases, over the signature of Dr. Ludwig Teleki. Bibliographies are attached to each chapter and contain references for the period 1940-1942. A short general bibliography is also included.

Queries and Minor Notes

• THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

POSSIBLE HAZARDS FROM FILARIASIS IN THE UNITED STATES

To the Editor:—Recently I was reading an article on filariasis by James T. Culbertson, Ph.D., in the July issue of the *American Journal of Nursing*. In this article it is implied that there is a definite danger of transmission of this disease from returned veterans infected with it to healthy persons in the United States, including New England, because infection is spread through the common house species of mosquito. This is a definite industrial problem because not a few of these men are working in schools learning welding with our native population in areas where mosquitoes are prevalent. Will you kindly let me know just the extent of this hazard and whether or not any preventive measures could be or should be taken.

David W. Parker, M.D., Manchester, N. H.

ANSWER.—Dr. Culbertson, in the article referred to, states that "with an abundance of suitable mosquito vectors available almost everywhere in this country, the transfer of the infection to native Americans, not only from these infected immigrants but also from the returning infected service men, seems possible and poses a problem to which public health authorities must give careful scrutiny."

The transmission of filariasis from returning infected troops is possible but probably will be exceedingly rare for a number of reasons. The transmission of filariasis by mosquitoes is somewhat hazardous to them. Heavy infections may result fatally to the mosquitoes. Further, there is no multiplication of the parasite in the mosquito as there is in malaria; hence the mosquito must secure from human blood a larva for every worm it transmits to a new victim. Further, it is believed that the infectious larva is not injected into the blood stream of man by the mosquito but is merely deposited on man's skin and must make its own way into the blood stream. These factors militate against transmission from man to man. In many parts of the United States, although mosquitoes are considered to be a pest and are certainly abundant, their numbers do not begin to approach those found in heavy filaria infected areas. It is possible, however, that through a fortuitous combination of all circumstances a mosquito might bite an infected person in this country and live to reinfest another person.

A number of years ago a large group of Negroes from a filaria infected area were imported into Charleston, S. C. Because of the climate there, mosquitoes can breed much of the year and in the early days before mosquito control they were unusually abundant. Thus the unusual combination of a large number of filaria infected individuals and a large number of mosquitoes much of the year resulted in the transmission of filariasis to a considerable number of persons in Charleston. A survey made there by Johnson in 1915 of 400 individuals composed largely of routine hospital admissions revealed an infection rate of 19.25 per cent. Within the last few years control measures to eliminate mosquitoes in the Charleston area have been pushed vigorously, and the screening of homes has become much more common. For these and possibly other reasons the transmission of filariae in the area has practically ceased and no new infections have occurred in Charleston in the past few years. In other words, the infection is dying out. If under the more or less ideal conditions of climate and a large initial infection this disease died out in Charleston, it does not seem likely that it will spread in the Northern areas of the United States, where mosquitoes are found in numbers only during the hot summer months.

Filaria infected persons have been reported from Columbia, Beaufort and Georgetown, S. C., Jacksonville, Fla., and Mobile, Ala. (Francis), Philadelphia, (Flint) and Boston (Lothrop and Pratt). These persons all give a history of having lived in Charleston, S. C., or having come from a filarial area in the tropics. No endemic foci or secondary cases arising from these infections have been reported, although the climate of several of these areas is favorable for mosquitoes and they are found in considerable abundance. In recent years thousands of Puerto Ricans and inhabitants of other infected Caribbean countries have entered the United States and made their homes here. A number of these individuals harbor large numbers of microfilariae in their blood but do not appear to have been the cause of additional cases of filariasis in this country.

On the other hand, filaria infections have been reported in individuals who have never been to Charleston, S. C., or out of

the United States. Dunn reports such an infection in Philadelphia, Slaughter two from Richmond, Va., and Mastin one from Mobile, Ala. Presumably these infections were acquired in these areas.

It is believed that the evidence at hand can be summarized as follows: It is remotely possible that returning filaria infected individuals may transmit, through mosquitoes, their infection to other individuals in this country. This occurrence, however, is extremely unlikely, and although the possibility must be borne in mind, it does not appear likely to be of any great importance.

References cited:

- Johnson, F. B.: Filarial Infection—An Investigation of Its Prevalence in Charleston, S. C., *South. M. J.* 8: 630 (July) 1915.
Francis, Edward: Filariasis in Southern United States, *Bull.* 117, Hyg. Lab., U. S. P. H. S., June 1919.
Flint, Austin: A Case of Filaria Sanguinis Hominis, with Chyluria. Treated Successfully with Methylene Blue, *New York M. J.* 61: 737 (June 15) 1895.
Lothrop, H. W., and Pratt, J. H.: A Report of Two Cases of Filariasis, *Am. J. M. Sc.*, November 1900, p. 1.
Dunn, Thomas D.: A Case of Filaria Sanguinis Hominis, *Tr. Coll. Physicians of Philadelphia* 20: 81, 1898.
Slaughter, R. M.: Two New Cases of Filaria Sanguinis Hominis, *M. News* 59: 649 (July-Dec.) 1891.
Mastin, William M.: The History of Filaria Sanguinis Hominis, Its Discovery in the United States and Especially the Relationship of the Parasite to Chylocele of the Tunica Vaginalis Testis, *Ann. Surg.* 8: 321 (July-Dec.) 1888.

QUARANTINE FOR POLIOMYELITIS

To the Editor:—The distant poliomyelitis involved area (Louisville, Ky., and Charlotte, N. C.) has our local school board in a quandary. Owing to pressure of a citizen, the school board has passed a resolution to quarantine all students and teachers who are not in the county. Actually the board intends to prohibit both from attending school until they have been in the county two weeks. This does not effect a quarantine, because all are free to mingle when school is not in session and may contact one another at picture shows or other places. On the surface of it the effort seems to void itself before it is put in effect. As a physician I suggest that, until the poliomyelitis problem is solved, all that is reasonable to do is to put into effect the well known rules of communicable diseases, namely, isolate the victim, quarantine those exposed. It seems rather arbitrary to rule a blanket quarantine. A county line has nothing to do with where or whether a person contracts a disease. A restriction of this kind certainly works hardship and extra expense (for teachers to pay board and the like) without accomplishing its purpose. So far as I know no student or teacher is coming here from the area around Louisville or Charlotte, yet all must be kept out of school until they have been in this county two weeks. Will you give me some statement as to whether the health rules known to all, as mentioned, are enough to use as a guide in handling this problem? Your recommendation will be appreciated, owing to the fact that the board's action seems rather radical.

M.D., Florida.

ANSWER.—There is no evidence that rigid quarantine of age groups is of any effect in the control of the spread of poliomyelitis. This but tends to spread panic and fear. There is no scientific reason for prohibiting persons from attending school until they have been in the county for two weeks. Most public health authorities agree that even in the presence of an epidemic there is no reason for not opening schools.

FLUORIDE FOR THE PREVENTION OF DENTAL CARIES

To the Editor:—I have been following the discussion on the advantages of fluoride in the prevention of dental caries and should like to obtain an authoritative opinion as to the practicability of using it as a prophylactic measure. What are the practical hazards, and why is it not being used more widely in private practice?

M.D., Massachusetts.

ANSWER.—The use of fluoride in the prevention of dental caries is in the experimental stage. A large amount of epidemiologic evidence shows that children who have used continuously since birth a domestic water containing as little fluoride as 1 part per million have only about one-third the amount of dental caries of children who have used a fluoride free water. This observation points to the probability that low fluorination of the public water supply may achieve an appreciable degree of mass control of dental caries. Several long term studies (ten to fifteen years) are being planned to test this hypothesis by fluorinating selected fluorine free city water supplies. Faust has recently estimated the cost of raising a fluorine free water supply to 1 part per million as 7.5 cents per person annually. Such control procedures would presumably be of value only to those born subsequent to the low fluorination of the public water supply, e. g. those who calcified their teeth while using a water with this optimal concentration. Whether or not such procedures would be effective in inhibiting dental attack in persons whose permanent teeth are erupted awaits further investigation.

Other investigators have directed their attention to topical application of fluoride in order to learn whether or not post-eruptive fluorine therapy can be utilized as a prophylactic measure for (a) that third of the population dependent on private

wells or other supplies for their source of water and (b) that part of the population whose permanent teeth have already erupted.

Several studies along these lines involving groups of school children have been reported. In each an appreciable reduction in the incidence of dental caries has been reported following multiple application of relatively high fluoride concentrations. In one study involving young men in a military population no change in dental caries attack was observed following a single application of a fluoride solution of 5,000 parts per million. Additional studies in this field are essential to determine the effectiveness of this therapy, the most desirable fluoride solution, the most efficacious concentration and the optimal number of applications to the teeth.

No practical hazards are known at this time, but much research is still needed to clarify some of the points discussed before recommendations for its general use seem warranted.

BURNS FROM LITHIUM

To the Editor:—An industrial plant has asked me to outline treatment and prophylaxis for burns by lithium chloride and hydroxide which occur on the hands, arms, face and legs and are penetrating, ulcerating burns. Is there any preparation that can be applied to the exposed surfaces for prevention?
M.D., Pennsylvania.

ANSWER.—Lithium is a soft metal with a silvery luster, having a specific gravity of 0.59. It melts at 180°F. and burns at 200°F. In order to prevent it from oxidizing, it is kept in petroleum. It readily decomposes in water, forming lithium hydroxide. Lithium, therefore, closely resembles sodium. Lithium chloride is similar to sodium chloride except that it deliquesces in air. Lithium hydroxide is caustic in its action, similar to sodium hydroxide. If lithium chloride enters abrasions it can cause erosion and ulceration of the skin. Lithium hydroxide can cause ulcers in the skin and in the nasal mucosa similar to those caused by sodium hydroxide.

The prevention of burns by lithium hydroxide is the same as the prevention of burns from sodium hydroxide; namely, those handling the material should wear rubber gauntlets and rubber aprons in order to protect the arms and legs. Transparent face shields will give protection to the face. Protective ointments are less efficacious. If they are used they should be of the lanolin-castor oil type described as type 3 in "Protective Ointments and Industrial Cleansers" by Louis Schwartz, published in the *Medical Clinics of North America* (26:1195 [July] 1942). The workers should also be instructed to insert petroleum jelly in the nostrils several times a day. In addition to this the tanks, vats or other containers of lithium hydroxide should be covered when not in use and vented by suction vents when they are in use so as to prevent exposure from vapors.

Workers should be instructed that if they get lithium hydroxide on the skin or clothing they should immediately flush it with water. Ulcers should be cleaned of crust and pus and treated aseptically.

SEDIMENT IN GASOLINE FUEL LINE

To the Editor:—In trying to suck gasoline through the fuel pump on his automobile, a man received some finely granular precipitate in his mouth. About ten minutes later he complained of severe burning of his mouth and lips, as if he had been burned by a corrosive poison. However, there was slight, if any, coloration of the tissues. At the time he received this material in his mouth he vomited and later ate a good supper but during the night had severe cramps in the abdomen, which cleared up rapidly with a milk and egg diet and calcium gluconate intravenously. What is this sludge that forms in gasoline cans and carburetors? Does it contain lead? If so, how soluble is it and what amount would be necessary to cause an acute lead colic? How is tetraethyl lead poisonous? Is it other than as a lead poison or does the tetraethyl have any poisonous property and would this cause any other symptoms than an acute lead colic?
John G. Beck, M.D., Sturgeon Bay, Wis.

ANSWER.—Most of the sludge deposited along an automobile fuel line is ordinary dirt. This is admixed with traces of waxes, paraffins, zinc chloride and possibly a trace of lead and dyes. The quantity of any one substance is not likely to represent any prospective toxicity. If an appreciable quantity of gasoline was swallowed, this becomes the likely source of irritation of the mouth and lips, abdominal cramps, and similar symptoms. The quantity of tetraethyl lead in a gallon of gasoline does not lend plausibility to the idea of lead poisoning from an uncertain swallow of this material. Tetraethyl lead to a substantial degree resembles in its injurious properties other forms of lead but with two noteworthy differences: Tetraethyl lead along with some other organic compounds is absorbable through the skin, while inorganic lead compounds are not. Also tetraethyl lead appears to have a predilection for action on the central nervous system to an extent or frequency unknown for inorganic lead compounds. It may be doubted that in the instance described in this query any lead poisoning occurred.

HYPERTENSION AND OBSTRUCTION OF THE URINARY TRACT

To the Editor:—How is the hypertensive state associated with chronic urinary retention produced? Particularly in question is that type of hypertension which accompanies obstruction of the neck of the bladder which subsides after decompression.
M.D., North Carolina.

ANSWER.—Elevation of blood pressure following obstruction of the urinary tract has been frequently observed since its first description in the latter half of the nineteenth century. Secondary hypertension occurs in about one third of all cases of prostatic obstruction. The definite lowering of blood pressure after the relief of an obstruction in the urogenital tract has led many to postulate that all patients with hypertension have some interference with urinary flow. Many studies indicate that all urinary causes of hypertension must be excluded before the diagnosis of essential hypertension can be established. Since not all patients have a lowering of blood pressure on the relief of urinary obstruction, there are other causes of hypertension.

Some of the more recent references to the literature on this subject include:

- Hayes, B. A., and Ashley, J. D.: Urologic Factors Influencing Hypertension, *J. Urol.* 50:366 (Sept.) 1943.
Braasch, W. F., and Wood, W. W., Jr.: Clinical Perinephritis and Its Effect on Blood Pressure, *Tr. Am. A. Genito-Urin. Surgons* 35:87, 1943.
Wosika, P. H.; Jung, F. T., and Maher, C. C.: Urologic Hypertension as an Entity, *Am. Heart J.* 24:483 (Oct.) 1942.
Weiss, Edward, and Chasis, Herbert: Failure of Nephrectomy to Influence Hypertension in Unilateral Kidney Disease, *The Journal*, Oct. 2, 1943, p. 277.

BIOPSY AND SPREAD OF CANCER TISSUE

To the Editor:—Can you give me statistics about the spreading of cancer cells after biopsy? Are there any clinical reports on that subject, especially concerning biopsy of cancerous diseases of the tonsils, tongue and larynx?
Zdenko V. De Dworzak, M.D., Santa Monica, Calif.

ANSWER.—There is no evidence to indicate that biopsies performed under proper circumstances cause the spread of cancer cells. The literature contains numerous reports on the subject. There are probably no monographs dealing exclusively with this problem, but a discussion of the subject can be found in various textbooks dealing with cancer.

CONSTIPATION AND HYPERTROPHIED HUSTON'S VALVES

To the Editor:—A woman aged 60 has chronic constipation with an occasional tendency to slight prolapse. She has a mild cancer phobia. She was recently examined and told that the condition was probably due to hypertrophied Huston's valves, and an operation was advised to section the valves. She was told there would be seven to eight stools a day for several months and that she should remain in the vicinity for observation during this period. Is this a well recognized operation?
M.D., Colorado.

ANSWER.—Constipation due to hypertrophied Huston's valves is a rare contingency. Operations on these valves at no time remove the cause of the constipation. The inspissated stool is initiated higher up in the colon and has nothing at all to do with the valvular derangement of the rectum. Unless x-ray evidence can show that there is a definitely dilated colon above these valves, their enlargement plays no part in the disturbed physiology of the gastrointestinal tract. Frequently patients of this age group suffer from constipation due to vitamin B₁ deficiency. Furthermore, it has been noted that in these individuals hypothyroid manifestations are not at all uncommon. This phase of the clinical picture should be investigated thoroughly.

TICK REPELLENTS

To the Editor:—Can you tell me of any substance or combination of substances that will act as a repellent of ticks? The Ozarks abound with several varieties of them, the so-called seed ticks, deer ticks and others of like size. I am aware of methods of removal such as chloroform, kerosene and heat. Is there any repellent that will keep the ticks off the skin even if they do get on the clothing?
Wallace A. Belsey, M.D., Campbell, Mo.

ANSWER.—Indalone, sold by the Skol Company, Inc., 250 East 43d Street, New York City 17, has been well recommended as a repellent for ticks. This synthetic compound is alpha, alpha-dimethyl-alpha-carbo-butoxydihydro-gamma-pyrone.

Another material has been developed for use by the armed forces and is known as 622. Unfortunately, only enough supplies are available for the armed forces at the present time. Undoubtedly, when the needs of the armed forces have been satisfied, other tick repellents of great efficiency will be made available to the general public.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

Vol. 126, No. 5

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

SEPTEMBER 30, 1944

THE POSTWAR CHALLENGE TO ORTHOPEDIC SURGERY

CHAIRMAN'S ADDRESS

GUY A. CALDWELL, M.D.
NEW ORLEANS

It may be said that the specialty of orthopedics had its origin in 1780, when Jean-André Venel established in Orbe, Switzerland, the first orthopedic institute for the correction of curvatures and torsions of the spine.¹ Little more than tenotomies and mechanical corrections of deformities were developed, however, prior to the works of William John Little, who established the Royal Orthopaedic Hospital in London in 1837, and Hugh Owen Thomas of Liverpool (1834-1891), whose name is perpetuated in his extension splints.¹ Thus the specialty became recognized in England and America only about a century ago. It was nearly fifty years later, however, that Robert Jones and his associates in England and Whitman, Davis, Bradford, Lovett and others in America truly emancipated the specialty into orthopedic surgery as we know it today. Of the advent of surgery in orthopedics, Whitman² wrote "It transformed an ill found and static specialty to an important and progressive branch of surgery."

The impetus given to orthopedics by operative surgery found expression in America in the establishment of the American Orthopaedic Association and, a little later, the Section on Orthopedic Surgery of the American Medical Association. There was, however, no comparable organization in Great Britain before World War I, and Robert Jones and his associates were virtually the only widely known orthopedic surgeons in England. As Betts³ stated, "At the outbreak of war in 1914 orthopedics as a special branch of surgery was comparatively unknown in Britain and Australia."

EFFECT OF WORLD WAR I ON ORTHOPEDIC SURGERY

Sir Robert Jones recognized in the large number of wounded and disabled soldiers a challenge to orthopedic surgery, which, with his exceptional skill and knowledge combined with a marvelous personality and

ability to organize, he met with such success that the specialty emerged much stronger than ever before. James A. Dickson,⁴ my illustrious predecessor as chairman of this section, stated in his address, two years ago:

Under serious opposition Robert Jones was entrusted with the establishment of the first military orthopedic service in any country, having 200 beds at Alder Hey in Liverpool. The results were so striking that within a short period 33,000 beds were equipped and staffed with English and American orthopedic surgeons. . . . According to Goldthwait, 65 per cent of the casualties in the last war were orthopedic cases, and by the time of the armistice 569 officers had served with the Orthopedic Division of the American Expeditionary Forces.

In a discussion of the evolution of orthopedic surgery Freiberg⁵ has aptly indicated the stimulus which World War I provided in the progress of orthopedics:

The World War had a great influence on orthopedic surgery, especially in Great Britain and in the United States. . . . By reason of the wider contacts which military experience brought to orthopedic surgeons, reciprocal relationships with their colleagues, of more intimate nature than civil life had furnished, were established. . . . They returned from military to civil life with their own professional concepts greatly expanded . . . very few of them resumed their civil occupations without profound alteration in their attitude toward their professional activities and toward their colleagues. . . . From the time when the identity of the orthopedic surgeon became recognized, the care and the rehabilitation of the cripple has been his particular province.

PROGRESS DURING PEACETIME

Because the medical officers assigned to orthopedic services during World War I returned to their civil occupations with "profound alteration in their attitude toward their professional activities and toward their colleagues,"⁵ rapid advancement of the specialty continued during peacetime. Numerous articles, journals and books began to appear in the literature. The American and British orthopedic associations flourished, the Section on Orthopedic Surgery of the American Medical Association became more active and soon many smaller groups appeared. Then, twelve years ago, the Academy of Orthopaedic Surgery was organized and two years later the American Board of Orthopaedic Surgery. The combined influence of these various groups and individuals began to be felt in medical schools, hospitals, communities, states and the entire nation. As a result a state and federal program was inaugurated to provide care for crippled children under the Social Security Act, the validity of the expert

From the Department of Surgery, Tulane University School of Medicine, and the Section on Bone and Joint Surgery, Ochsner Clinic.

Read before the Section on Orthopedic Surgery at the Ninety-Fourth Annual Session of the American Medical Association, June 15, 1944.

1. Garrison, F. H.: *Introduction to the History of Medicine*, Philadelphia, W. B. Saunders Company, 1929.

2. Whitman, R.: *The Emancipation of Orthopaedic Surgery*, *Proc. Roy. Soc. Med.* 36: 327-329 (May) 1943.

3. Betts, L. O.: *Orthopaedics and the Great War*, *M. J. Australia* 2: 35-38 (July 13) 1940.

4. Dickson, J. A.: *Orthopedic Surgery Between Two Wars*, *J. A. M. A.* 120: 413-416 (Oct. 10) 1942.

5. Freiberg, A. H.: *Orthopaedic Surgery in the Light of Its Evolution*, *J. Bone & Joint Surg.* 19: 279-296 (April) 1937.

opinions of orthopedists was recognized in courts and by compensation commissions on disability ratings, and the National Foundation for Infantile Paralysis and similar agencies were organized.

Although expansion of orthopedic surgery as a specialty was rapid during the twenty-four year interval of peace, it failed to keep pace of the demand. So well defined is the role of the orthopedic surgeon in the tables of organization of the armed forces that immediate demand for all physically fit surgeons under 45 years of age was made on the profession. The response was prompt, but unfortunately the number available was all too small. Whereas 288 surgeons certified by the American Board of Orthopaedic Surgery are now serving with the armed forces in responsible positions, each of them is being assisted by three or more partly trained orthopedic surgeons or general surgeons. In this way a large new group, approximately 900, is being drawn into intimate contact with the specialty and it is safe to predict that more than half of these will complete their training after the war, will limit their practice to this specialty and ultimately will be certified as orthopedic surgeons. Meanwhile a greatly diminished, nevertheless considerable, number of younger men, disqualified for military service, are continuing their training in routine channels at home. It is highly probable, therefore, that within the next five or ten years the number of men certified in the specialty of orthopedic surgery will be doubled or perhaps trebled, until it will reach 2,000 to 2,500 men in the United States.

At first glance it might appear that such rapid increase in the number of men certified to practice orthopedic surgery might overcrowd the specialty. If we study the probable postwar demands, however, it appears likely that the requirements will be far greater than the increased numbers can serve. The contacts of hundreds of thousands of young men and women now in the armed forces with organized orthopedic services are numerous. From the induction centers, where part of the physical examination is done by orthopedists, to minor or major injuries received while in training and treated on orthopedic services of the camp or station hospitals, on through combat duty, when those with wounds in the extremity trail back through evacuation hospitals to the orthopedic services of the general hospitals abroad and at home, thousands on thousands will learn for the first time the value of special training and skill in the care of crippling diseases and injuries. This knowledge is shared by other thousands of their buddies, families and hospital attendants and will go back with them into civil life. From the homes and families established by these men it is certain that greater and more frequent demands will be made for orthopedic care.

Large numbers of professional personnel with the armed forces—physicians and nurses not assigned to orthopedic services—are daily brought face to face with the fact that in army hospitals throughout this country 35 to 40 per cent of the patients are in orthopedic services, and in the combat areas 65 per cent of the wounded have injuries of the extremities. They perforce become "orthopedic conscious" by daily reference of patients and requests for orthopedic consultations. On their return to civil life it will be second nature to refer such patients for orthopedic care.

During the early postwar period Veterans' Facilities must necessarily be greatly expanded and the orthopedic services conspicuously enlarged. Already the Vocational Training and Rehabilitation Program under the Social Security Act as amended in June 1943 is providing a system for medical care which will include a large percentage of orthopedic cases. State crippled children's services, which have been compelled to operate with skeleton staffs, will enlarge to their former size, and many new organizations will lend aid to orthopedic programs.

Therefore the postwar demand on the specialty of orthopedic surgery will be strikingly increased as a result of our awakened consciousness of the meaning and value of orthopedic service through observation of its work in the armed forces by thousands of lay and professional workers who will eventually return to civil life in widely scattered areas. Their demands will be supplemented by those growing out of the gradual spread and natural growth of civilian orthopedics through development and expansion of the programs for crippled children and vocational rehabilitation. Soon the man in the street will cease to stammer and stall when he attempts to pronounce orthopedist and to confuse the term with osteopath, chiropractor and chiropodist. Moreover, the public is rapidly realizing the truth of Freiberg's statement that "from the time when the identity of the orthopedic surgeon became recognized the care and the rehabilitation of the cripple has been his particular province."

The postwar challenge to orthopedic surgery is presented by the assurance of an overwhelming demand for its assistance to rehabilitate the cripples and the equal certainty that, although the number of trained orthopedists available to meet this demand will be greatly increased, it will be insufficient. In 1942 there were 180,496 physicians in the United States, only 707 of whom were certified orthopedists, or 0.39 per cent. When this small percentage is balanced against the fact that in military hospitals about 40 per cent of the work is assigned to orthopedic services, it is not improbable that postwar civilian demands will require that 20 to 25 per cent of its hospital population be cared for by orthopedists. If we assume that the number of physicians will be 200,000 and the increased number of orthopedic surgeons 2,000, we are confronted by a situation in which 1 per cent of the physicians will be trying to care for 20 to 25 per cent of the hospitalized patients.

What can we do to meet this challenge? First, we must inventory our assets and organize them to meet this situation to the best advantage. It is obvious that the basic need is for the rapid but efficient training of a large number of younger physicians. To accomplish this it will be necessary for every practicing orthopedist to constitute himself a teacher and use his facilities and time to assist in training several younger men to succeed him. More articles, periodicals and books on orthopedic problems should be published. Organizations such as this one, the orthopedic section of the greatest medical association in the world, together with the American Orthopedic Association, the Academy and all of the smaller, more intimate, groups should plan constructive programs of instruction that will awaken interest and attract younger men to the field of orthopedic surgery. Medical schools and their

graduate departments should enlarge their facilities and apportion their time to provide more emphasis on instruction in this surgical specialty. Hospitals should begin to organize their orthopedic services for approved resident training in this special branch of surgery. Nursing schools should encourage some of their graduates to specialize in this field and others to train in physical therapy and occupational therapy.

At present the report of the Council on Medical Education and Hospitals lists only 84 approved resident training services in orthopedic surgery, most of these in the older centers or affiliated with universities or hospitals for crippled children. A survey of hospitals having orthopedic services for crippled children staffed by specialists certified by the American Board of Orthopaedic Surgery reveals 200 services which should be qualified and approved for training. Many other general hospitals have large services for fractures and other traumatic injuries of the extremities that have sufficient clinical material under competent supervision to provide adequate training for orthopedic residents for at least one of the three required years. Every medical school in the country can and should provide six months of graduate training, especially in the basic sciences of anatomy, pathology, physiology and biochemistry, to supplement the training of men who may acquire their clinical experience in hospitals and clinics not affiliated with universities.

Retired or demobilized medical officers will be eligible for graduate training in various specialties with governmental pay. Advantage should be taken of this to offer supplementary training to all officers who have served in orthopedic services with the armed forces and to attract additional young men who have been serving with the field units. Experienced orthopedic surgeons now in the service who are capable of teaching should be demobilized and returned to their teaching posts as rapidly as possible to assist in this great move. Every one of us must look ahead and begin now to arrange his work and hospital service to provide time and facilities for instruction for those who will be needed to meet this great postwar need.

SUMMARY

As rapid as have been the advances of the specialty of orthopedic surgery during the last fifty years, it has been unable to keep abreast of the increasing demand. World War II has accentuated the demand without helping materially to increase the number of trained orthopedists to meet it. It appears probable that in the postwar period 1 per cent of the physicians specializing in orthopedic surgery will be required to care for 20 to 25 per cent of the hospitalized civilians. It is therefore urgent that more men be trained in the specialty. To provide orthopedic training for the number of physicians who will be needed in the postwar era, all available hospital services should be qualified for approval by the Council on Medical Education and Hospitals and the American Board of Orthopaedic Surgery, and all medical schools should expand their teaching facilities for orthopedics, especially their graduate courses in the basic sciences of anatomy, pathology, physiology and biochemistry.

3503 Prytania Street.

A PSYCHIATRIC STUDY OF SUCCESSFUL SOLDIERS

CAPTAIN JACK G. SHEPS

ROYAL CANADIAN ARMY MEDICAL CORPS

Studies of soldiers who broke down in training or under what was considered to be minimal stress in battle led to the establishment of present standards for psychiatric screening. These standards have been criticized on the grounds that they were based on observations of selected groups. It has been suggested that men with good motivation and a desire to serve can cover up and compensate for psychoneurosis. This paper is an attempt to test our psychiatric screening standards by a study of 116 successful soldiers and compares the findings with those obtained in studies of neurotic soldiers.

Studies of neurotic soldiers have been done by Rosenberg¹ and Slater.² Ebaugh³ and his associates studied 100 soldiers designated as well adjusted by their officers and compared them with 100 psychiatric cases. Uninjured combat veterans with no complaints were studied by Schwab, Finesinger and Brazier⁴ and compared with cases of combat neurosis and neurosis developed in training. Steinberg and Wittman⁵ studied ordinary soldiers and compared them with a group of neurotic and psychotic patients.

This is a study of 115 soldiers and 1 sailor. Fifty-eight at several camps in various phases of training were chosen by their training officers as the best all around men in a group—usually a platoon. Fifty-seven soldiers and 1 sailor injured in a theater of action were also studied. These men entered the service before psychiatric screening was established, but they were all front line fighting troops and had no presenting psychiatric disabilities. Men from base areas or lines of communication, subject only to air raids, were excluded. In the case of the soldiers in training, a short report from the training officer accompanied the man explaining why he was chosen, together with a note by the personnel selection officer. A limited social service investigation was done in every case. A psychiatric interview of at least thirty minutes was carried out. The purpose of the study was outlined and the man's cooperation enlisted. It was stressed that the interview was unofficial and would in no way affect the soldier's career in the Army or the matter of pensions. All the men cooperated very well and spoke freely. Most of the combat veterans came from two regiments, and it was possible to check on their behavior with others in the same unit. Two of the veterans

From No. 2 District Depot, Toronto, Ontario, Canada.

Read before the Section on Nervous and Mental Diseases at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Rosenberg, S. J., and Lambert, R. H.: Analysis of Certain Factors in Histories of 200 Soldiers Discharged from the Army for Neuropsychiatric Disabilities, *Am. J. Psychiat.* **99**: 164 (Sept.) 1942.

2. Slater, E.: The Neurotic Constitution, *J. Neurol. & Psychiat.* **6**: 1-16 (Jan.-April) 1943.

3. Billings, E. G.; Ebaugh, F. G.; Morgan, D. W., and others: A Comparison of 100 Army Psychiatric Patients and 100 Enlisted Men, *War Med.* **4**: 283-298 (Sept.) 1943.

4. Schwab, R. S.; Finesinger, J. E., and Brazier, M.: Psychoneurosis Precipitated by Combat, *U. S. Nav. M. Bull.* **47**: 535-544 (March) 1944.

5. Steinberg, D. L., and Wittman, M. P.: Etiologic Factors in the Adjustment of Men in the Armed Forces, *War Med.* **4**: 129-139 (Aug.) 1943.

enjoyed a more intimate relationship—they were wounded by the same bomb. The study was restricted to noncommissioned men; all but 9 were privates. The soldiers in training had been in the Army from three to eight months and the combat veterans from two to four years, about half having been wounded in the Sicilian campaign and half in the Italian campaign. After each interview the man was graded as if he were a candidate for enlistment, without taking into consideration his progress and record in the Army.

FINDINGS

Ages ranged from 18 to 40 years, with 77 men between 20 and 30. The racial origins reflected approximately the distribution in the general population.

Army aptitude test scores were available for the 58 soldiers in training and 26 combat veterans. Forty-three per cent fell into the highest 5 per cent and only 10 per cent into the lowest 30 per cent.

Only 8 of the 116 did not complete elementary school, and only 3 of these had poor school records. Four of the men attended university and the rest attended high school.

Greatly Diminished Incidence of Significant Psychiatric Data in Successful Soldiers as Compared with Psychiatric Discharges

	Present Series, %	Slater, %	Rosenberg and Lambert, %
Work history			
Poor work record.....	1.0	....	54.0
Skilled and semiskilled.....	85.0	48.0	....
Family history.....	14.6	65.7	39.5
Childhood neurotic traits.....	31.0	58.8	....
Bad home.....	6.8	20.9	....
Previous personality or mental disorder.....	3.4	40.0	89.0

One hundred and seven men had worked for one or more years; 33 were classified as engaged in skilled work, 58 semiskilled and 16 unskilled. Only 1 had a poor work record.

Thirty-eight had had previous military experience in the militia or cadets.

The family history was considered to be significant where psychoses or epilepsy occurred in the immediate family or first degree relatives, or where neurosis and severe personality maladjustments, such as chronic alcoholism or constitutional psychopathy, occurred in the more immediate family. There were 17 significant family histories. These included 3 cases of epileptic seizures in an uncle, aunt and brother, and schizophrenia in an uncle. If one excludes these as not being a factor in the predisposition to neurosis, there remain 13 positive family histories.

A bad home, in the sense of excessive poverty, drunkenness or family disagreement with constant anxiety and uncertainty, was present in 8 cases, and in half of these one parent deserted the family when the soldier was under 13.

Forty-nine men showed some signs of instability:

- Ten had pulse rates of 90 to 100.
- Fifteen showed nail biting—only 1 severe.
- Twenty-four showed tremor and sweating of the hands—only 1 severe.

Neurotic traits in childhood were present in 36 of the men; 24 had one trait, 7 had two traits and 5 had three traits.

Personality assessment is difficult in one interview, but 18 men could be classed roughly as introverted and 23 as extroverted. Seventy-five fell into neither of these categories. All had made good social adjustments and had normal recreational outlets. None of the men had any spontaneous health or "nerve" complaints.

An effort was made to see if the men understood the principles at stake in this war. I considered them to have good motivation if they could define fascism as an authoritative, dictatorial form of government, if they understood the concept of "master race" as used by the fascists, if they were conscious that fascist and democratic states could not exist side by side and if they felt that there would be no place for them in a world ruled by fascism. A great deal of importance was attached to the last question, and the motivation was graded good, fair or poor. Ninety-four were found to have good motivation, 4 fair and 18 poor.

Four men were downgraded at the time of this study, 1 for base duties in a theater of action and 3 for service in Canada only. These were all in the group of training soldiers. Seven were graded "accept for recheck"; that is, they would be seen by a psychiatrist at the end of a period of training.

COMMENT

The table compares certain of these findings with those of Slater² and Rosenberg¹ in their studies of soldiers with psychiatric disabilities and emphasizes the low incidence of significant psychiatric data in this series. Ebaugh,³ Steinberg⁴ and Schwab⁴ do not give absolute figures, but all report a much greater incidence of signs and symptoms of instability, positive family and developmental histories and poor social and work adjustments as compared with their controls of normal men.

This study was undertaken to evaluate a criticism which few service psychiatrists take seriously; that is, that our standards are too strict and that we screen out men who would make good combat soldiers. If this criticism were valid, one would expect to find more men who do not meet the present screening standards among the unscreened battle veterans than in the screened group of soldiers in training. The soldiers in training went through our screening, and there were indications for the downgrading of 4. All of the "accept for recheck" cases would have had their gradings for full duty confirmed. All the combat veterans enlisted in the Army before adequate psychiatric screening was established, but a natural selection had taken place, with weeding out of the psychiatrically unfit during training, the battle of Britain and a long period of waiting before action. All had been through battle stress, and none had developed a psychiatric disability. That our screening standards are no stricter than natural battle stress screening is shown by the fact that none of these men whose stability was unaffected by battle would have been rejected. Thus our errors are, if anything, in the direction of leniency.

It is interesting that only 15 of the training soldiers had clear family and developmental histories and presented no signs or symptoms of instability, but apart

from the 4 that were downgraded their original assessments were correct, and they were making good soldiers.

Only 24 of the 58 combat veterans were completely "normal," and yet all of them had seen action without developing any psychiatric disability. This bears out the conclusions of Steinberg,⁶ who says that "for every factor investigated there is a definite overlap of adjusted and maladjusted groups. The number and intensity of these factors evidently are cumulative in their effect and on the adjustment of the individual selectee." In this group the 2 cases showing severe fingernail biting, tremor and sweating of the hands, and 3 of the 5 men presenting three childhood neurotic traits were downgraded. Of the remaining 2, 1 would be accepted for recheck.

It must be emphasized, however, that the total picture of the individual man in his environment must be considered and all significant data evaluated in the light of his present civilian adjustment. The frank neurotic, psychopath or prepsychotic personality is not a diagnostic difficulty, yet it is generally agreed that if only these are rejected a considerable number of men will still break down in training or after minimal stress in a theater of action.

It is the feeling of psychiatrists in the Canadian Army that the maintenance of proper screening standards depends on the experience of the screening psychiatrists with men who break down in training or are returned from overseas because of psychiatric disability. Doubtful cases are accepted for recheck, and the screening psychiatrist receives a copy of the report of the examination at the training center. Study of the percentage and types of these cases that require a lowering of category provides a check on the validity and reliability of the psychiatric evaluations of the individual psychiatrists. It has been found that the rejection rates of the psychiatrists at the same induction centers differ very little in spite of varied training and professional backgrounds and in spite of the lack of objective criteria that can be laid down for rejection. It is not felt that psychiatric screening can ever exclude all psychiatric casualties, but, as Kubie⁶ maintains it should greatly reduce the number occurring in training and under minimal battle stress.

SUMMARY AND CONCLUSIONS

1. Fifty-eight successful soldiers in training (screened) and 58 combat veterans (unscreened) with no presenting psychiatric disability were studied.

2. Screening standards in use at present in induction centers of the Canadian Army were applied. Using these standards, 4 training soldiers were downgraded, 1 to limited duty in a theater of action, 3 to service in Canada only. None of the combat veterans were downgraded.

3. There was no significant difference in the findings in the two groups of men.

4. Ninety-four were found to have good motivation and high morale. This factor can be adequately assessed only after studies of unselected groups have been made.

5. Soldiers who have stood the stress of battle without developing a psychiatric disability and the best soldiers in training are distinguished from their neurotic fellows by being stable, well adjusted and intelligent, with fewer and milder significant psychiatric stigmas.

6. Results of this study indicate that psychiatric screening standards at present employed are not too strict.

ABSTRACT OF DISCUSSION

LIEUTENANT COLONEL J. D. GRIFFIN, R. C. A. M. C.: One essential problem facing the psychiatrist in his examination of recruits at the induction center concerns the answer to the question What are men being selected for? We are prone to think that our primary goal is to get the man through training, and so we select men for training. It is obvious that that is not the only goal of selection. The goal of the soldier is to fight, and so we must select for combat too, and that makes it pretty hard; for the man who is a good fighter and a good combat soldier is not necessarily also able to take the long dreary months of training, discipline, regimentation, education in the classroom sense and the separation from home and family and from his old job. There is another problem facing our psychiatrist. I refer to the unpleasant position the service and civilian psychiatrist finds himself in when he discovers that he is between the pressure of the politicians and the people at the top, who feel that the army is somehow not getting enough men, that the men already in are somehow melting away largely through the efforts of the psychiatrists, and on the other hand the pressure that comes from the training officers, the men in charge of the training camps, who say "You're doing a swell job, only do more of it. We don't want these fellows. They don't make good soldiers. Tighten your standards." There are six ways in which we try to keep our sights on the target. The first is that we use only service psychiatrists for screening recruits. All the psychiatrists in the induction centers are in the army. Secondly, we send the psychiatrists into the field frequently so that they may check up personally on the type of men they have let in. That makes it possible for them to reexamine after six to eight weeks of training many of the men whom they were rather doubtful of at the induction center. This is our so-called Accept for Recheck System. Our figures show that over 60 per cent of these men are making the grade as successful soldiers, which is a reasonable margin of error, I think. Thirdly, we have a social service organization in the army belonging to the medical corps, which checks the social and medical background of doubtful cases. We have had in addition an experimental project under way by which we are deliberately taking into the army through our induction centers men who would ordinarily be rejected because of instability. These men, a hundred of them, are at present in training with a modified training program stressing group psychotherapy and special indoctrination and educational procedures.

Thomas Hodgkin.—Thomas Hodgkin (1798-1866), after graduating in medicine at Edinburgh in 1823 and studying intensively in France and Italy, settled in practice in London and was appointed curator of the pathologic museum and demonstrator of pathology at Guy's Hospital, London. This was one of the first chairs of this particular subject to be created. Hodgkin held it for ten years and made many important studies of the pathologic collections. His paper on the diseases of the "absorbent glands and spleen" published in 1832 first described the disease which Wilks in 1865 named Hodgkin's disease. Hodgkin was noted for his philanthropic labors. He was a close friend of Sir Moses Montefiore, the Jewish philanthropist, and while traveling with Sir Moses in the Orient contracted dysentery and died at Joffa, where he is buried.—Clendening, Logan: Source Book of Medical History, New York, Paul B. Hoeber, Inc., 1942.

6. Kubie, L. S.: The Detection of Potential Psychosomatic Breakdowns in the Selection of Men for the Armed Forces, *Ann. New York Acad. Sc.* 44: 605-624 (Dec. 22) 1943.

THE USE OF PENICILLIN IN
RHEUMATIC FEVERLIEUTENANT COMMANDER ROBERT F. WATSON
(MC), U.S.N.R.

SIDNEY ROTHBARD, M.D.

AND

HOMER F. SWIFT, M.D.

NEW YORK

Although the etiology of rheumatic fever is not fully understood, current data indicate that attacks of this disease are generally preceded by infections with group A hemolytic streptococci. The sequence of events is so regular that one is justified in advancing the hypothesis that the streptococcal infection induces rheumatic fever. Whether group A streptococci are the only infectious agents responsible for rheumatic fever or whether they merely activate some other specific micro-organism or virus and possibly act in concert with it to produce the disease has not been determined. The temporal relationship between the hemolytic streptococcal infection and the attack of rheumatic fever is generally not immediate. In fact, the usual sequence of events is streptococcal infection, quiescent period, rheumatic fever. These phases have been designated as I, II and III respectively. It has been shown that if the initiating or inducing streptococcal infection, phase I, is prevented in susceptible subjects, then rheumatic fever fails to occur.¹ This is presumably the basis for the prophylaxis of rheumatic fever by the sulfonamides.

With these relationships in mind, it appeared rational to test the influence on the course of rheumatic fever of such a potent antistreptococcal agent as penicillin, for it must be admitted that the drug therapy to date is far from satisfactory. Salicylates, and such chemically unrelated drugs as aminopyrine and neocinchophen, appear to act in the tissues by altering their response to the "noxious agent" and not directly on the inducing agent, the hemolytic streptococcus. Penicillin, on the other hand, appears to exert its curative action by inhibiting the growth of certain pathogenic micro-organisms. If, then, the continuing symptoms of rheumatic fever are due to the persistence of hemolytic streptococci in the patient's tissues, it might be expected that complete removal of these micro-organisms by means of penicillin would favorably affect the course of this disease.

It is well established that sulfanilamide, which is known to be effective against hemolytic streptococcal infections, exerts no beneficial influence on rheumatic

fever but often aggravates the symptoms when given during the active phase of the disease.² The sulfonamides, however, often do not completely eliminate hemolytic streptococci from patients with pharyngitis, tonsillitis or scarlet fever.³ It therefore seemed desirable to test the effect on rheumatic fever of the more powerful antibacterial agent penicillin. Sufficient amounts of this drug were made available by Dr. Chester S. Keefer to study this problem, and the present report gives the details of this study.

METHODS

Eight young men with typical acute rheumatic fever were each treated for two weeks with penicillin. During this period salicylates and other antirheumatic drugs were usually withheld as long as seemed justifiable. The changes in signs and symptoms were noted and charted daily as indicated in the case histories. In addition, leukocyte counts, erythrocyte sedimentation rates, nose and throat cultures, electrocardiograms and x-rays of the chest were taken at frequent intervals. Samples of blood were also obtained once a week for determination of antistreptolysin and antifibrinolysin titers and at various intervals after injections of penicillin to determine its concentration in the patient's serum.

The method of administering the penicillin was varied. Two patients received the drug intramuscularly at four hour intervals during the night and intravenously at three hour intervals during the day for two weeks. Four patients were treated in a like manner for the first week and then only by the intravenous route at three hour intervals from 9 a. m. through 12 midnight for the second week. The 2 remaining patients were given penicillin by the continuous intravenous drip method for one week and then intravenously at three hour intervals from 9 a. m. through 12 midnight during the second week. Because of the possible danger of precipitating cardiac failure in patients with acute rheumatic fever, we hesitated to employ the continuous drip intravenously for long periods and particularly to use large amounts of isotonic solution of sodium chloride. For the constant intravenous method 37,500 units was dissolved in 500 cc. of distilled water containing 5 per cent glucose or occasionally in isotonic solution of sodium chloride. The rate of delivery was 35 to 40 drops per minute or 500 cc. every four hours. The individual intravenous injections contained 40,000 units each except in 1 case, in which the dose was 25,000. The intramuscular injections invariably contained 25,000 units.

The Westergren method was used to determine the erythrocyte sedimentation rate.⁴ The antistreptolysin determinations were made according to the method of Todd and modified as previously described;⁵ the antifibrinolysin determinations were made according to the methods described by Tillett, Edwards and Garner and

2 Swift, H. F., Moen, J. K., and Hirst, G. K.: The Action of Sulfanilamide in Rheumatic Fever, *J. A. M. A.* **110**: 426-434 (Feb. 5) 1938. Massell, B. F., and Jones, T. D.: The Effect of Sulfanilamide on Rheumatic Fever and Chorea, *New England J. Med.* **218**: 876-878 (May 26) 1938.

3 Unpublished observations.

4 Westergren, A.: Studies of the Suspension Stability of the I¹ in Pulmonary Tuberculosis, *Acta med. Scandinav.* **51**: 247-252 (Jan.) 1921.

5 Todd, E. W.: Antigenic Streptococcal Hemolysin, *J. Exper. Med.* **55**: 267-280 (Feb.) 1932. Hodge, B. E., and Swift, H. F.: Hemolytic and Constant Combining Capacity of Streptolysins, *Ann. N. Y. Acad. Sci.* **58**: 277-287 (1944).

From the United States Navy Research Unit at the Hospital of the Rockefeller Institute for Medical Research and the Hospital of the Rockefeller Institute for Medical Research.

The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigations recommended by the Committee on Chemotherapeutic and Other Agents of the National Research Council.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Coburn, A. F., and Moore, L. V.: The Prophylactic Use of Sulfanilamide in Streptococcal Respiratory Infections, with Especial Reference to Rheumatic Fever, *J. Clin. Investigation* **18**: 147-155 (Jan.) 1939. Thomas, Caroline B., and France, R. A.: A Preliminary Report on the Prophylactic Use of Sulfanilamide in Patients Susceptible to Rheumatic Fever, *Bull. Johns Hopkins Hosp.* **64**: 67-77 (Jan.) 1939. Kuttner, A. G., and Reysersbach, G.: The Prevention of Streptococcal Upper Respiratory Infections and Rheumatic Recurrences in Rheumatic Children by the Prophylactic Use of Sulfanilamide, *J. Clin. Investigation* **22**: 77-85 (Jan.) 1943.

by Boisvert.⁶ Representative colonies of all hemolytic streptococci recovered from these patients were grouped and typed by the precipitin technic⁷ and tested in vitro for susceptibility to penicillin. These tests for susceptibility, as well as the determinations of serum concentrations of penicillin, were done by the dilution method described by Rammelkamp.⁸ A standard strain of group A hemolytic streptococcus was used as a control in each experiment.⁹ The samples of blood were defibrinated and stored in the ice box at 4 C. for twelve to twenty-four hours before the determinations were made. We have found that specimens of blood may be thus stored for as long as two weeks without demonstrable loss in the concentration of penicillin.

REPORT OF CASES

CASE 1.—History (chart 1).—D. H., aged 23, was admitted on Jan. 8, 1944 on the sixth day of an attack of rheumatic fever. Two previous attacks had occurred when he was 11 and 12 years of age respectively. An upper respiratory infection on December 15 was followed in nineteen days by pain and swelling in the left foot, shoulder, wrist and both knees.

On admission the temperature was 102.2 F., the pulse rate 92 and the respiratory rate 24 per minute. Arthritis was present as charted. The heart was enlarged to the left by percussion. Auscultation revealed a systolic murmur at the apex and a diastolic blow at the base. The blood pressure was 128/65.

Laboratory examination on admission revealed red blood cells 3,610,000, hemoglobin 79 per cent, white blood cells 10,950, erythrocyte sedimentation rate 115 mm. per hour, cultures of the nasopharynx yielding no hemolytic streptococci, electrocardiogram essentially normal with a PR interval of 0.17 second, x-ray examination of chest disclosing heart enlarged in the region of the left ventricle.

Course.—Penicillin was started on the day of admission. During the first twenty-four hours the patient was given 25,000 units intramuscularly every four hours. For the next six days he was given 25,000 units intravenously every three hours during the day and 25,000 units intramuscularly at four hour intervals at night. During the second week he received daily six intravenous injections at three hour intervals from 9 a. m. through 12 midnight. A total of 1,975,000 units was given over the two week period. The temperature remained elevated throughout the period of penicillin therapy. The arthritis increased during the first week to involve as many as ten different joints and gradually diminished during the second week. Three days after penicillin treatment was started the erythrocyte sedimentation rate had increased to 128 mm. per hour. On the sixth day after the cessation of penicillin therapy it was 135 mm. per hour and moderate fever persisted. At this time the patient was started on salicylates, with a prompt drop in temperature to normal.

About three and one-half months after the onset of the attack the erythrocyte sedimentation rate became normal, but the signs of aortic and mitral insufficiency persisted. Convalescence thereafter was uninterrupted.

6. Tillett, W. S.; Edwards, L. B., and Garner, R. L.: Fibrinolytic Activity of Hemolytic Streptococci: The Development of Resistance to Fibrinolysis Following Acute Hemolytic Streptococcus Infections, *J. Clin. Investigation* 13: 47-78 (Jan.) 1934. Boisvert, P. L.: The Streptococcal Antifibrinolysin Test in Clinical Use, *ibid.* 19: 65-74 (Jan.) 1940.

7. Lancefield, Rebecca C.: The Antigenic Complex of Streptococcus Hemolyticus. I. The Demonstration of a Type Specific Substance in Extracts of Streptococcus Hemolyticus, *J. Exper. Med.* 47: 91-103 (Jan.) 1928; A Micro Precipitin Technic for Classifying Hemolytic Streptococci, and Improved Methods for Producing Antisera, *Proc. Soc. Exper. Biol. & Med.* 38: 473-478 (May) 1938. Swift, H. F.; Wilson, A. T., and Lancefield, Rebecca C.: Typing Group A Hemolytic Streptococci by M Precipitin Reactions in Capillary Pipettes, *J. Exper. Med.* 78: 127-133 (Aug.) 1943.

8. Rammelkamp, C. H.: A Method for Determining the Concentration of Penicillin in Body Fluids and Exudates, *Proc. Soc. Exper. Biol. & Med.* 51: 95-97 (Oct.) 1942.

9. The Standard Strain of group A hemolytic streptococcus number 98 was kindly furnished us by Dr. Chester Keefer.

In this case there was no evidence that penicillin treatment altered the course of the disease. The patient appeared ill until placed under full therapeutic doses of salicylates. The persistence of an elevated erythrocyte sedimentation rate for over three months indicates that the course of the rheumatic fever had probably not been curtailed by the penicillin therapy.

CASE 2.—History.—M. K., aged 18, was admitted on Jan. 11, 1944 with his first attack of rheumatic fever. Early in December 1943 he developed a cold, which was followed about two weeks later by pain and stiffness in the hips and in the toes of both feet. These symptoms persisted intermittently and at times were severe but did not confine him to bed. On January 3 he developed pain, tenderness and swelling of the right ankle, and during the next six days both hips, knees, the left ankle and the foot became involved. On January 9 he was transferred to the U. S. Naval Hospital, Brooklyn, where erythema marginatum was noted over the trunk for only one day. During the two days in that hospital the patient received

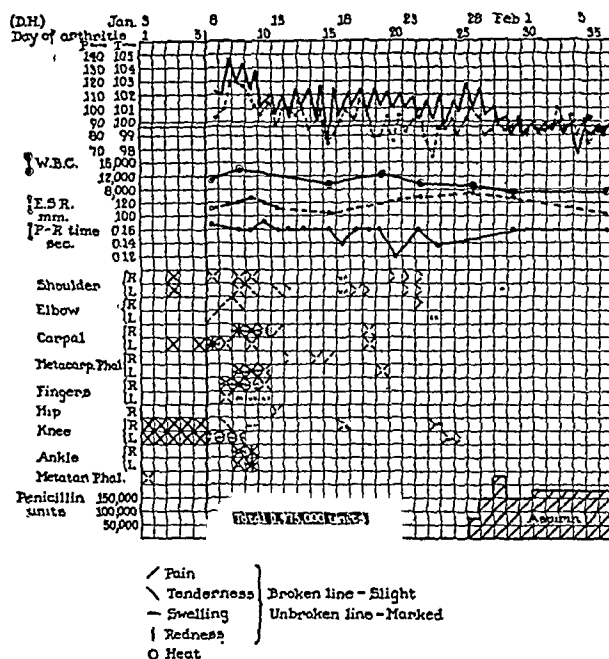


Chart 1.—Course in case 1.

about 3 Gm. of acetylsalicylic acid, with partial relief of symptoms. On the day of admission to the Rockefeller Hospital, stiffness in the right elbow was noted for the first time.

On admission the temperature was 100.4 F., pulse rate 80 and respiratory rate 20 per minute. The patient appeared acutely ill and had pallor of the skin and mucous membranes but no rash. There were pain and tenderness of the right elbow, the first interphalangeal joint of the left middle finger and both hips and slight tenderness over the left knee, ankle and the toes of the left foot. The right knee and ankle were painful, tender and swollen. The heart was at the upper limits of normal in size on percussion. A soft systolic murmur was heard along the left sternal border and a third sound at the apex early in diastole.

The blood pressure was 112/28.

On admission the laboratory examination revealed red blood cells 3,400,000, hemoglobin 74 per cent, white blood cells 9,400, erythrocyte sedimentation rate 128 mm. per hour, throat culture yielding group A type 24 hemolytic streptococci, electrocardiogram essentially normal with a PR interval of 0.13 second, x-ray examination of chest disclosing heart slightly enlarged in its transverse diameter.

Course.—On January 12, the day after admission, penicillin therapy was started, and during the next fourteen days he received a total of 3,350,000 units by the intravenous and intramuscular routes. For the first four days the temperature gradually increased daily, so that by the fourth day of penicillin treatment it had reached 103.3 F. and the arthritis had progressed to involve practically every joint in the body. During the next six days the fever gradually dropped to 99.3 F. and the arthritis receded, so that by the tenth day of penicillin therapy only slight pain in the right shoulder, elbow and fingers of both hands was present. The erythrocyte sedimentation rate, however, was 95 mm. per hour. During the next four days, while the patient was still receiving penicillin, the fever and moderate arthritis recurred. Following the cessation of penicillin on January 26 he continued to improve; the temperature again gradually fell to normal, the arthritis receded slowly and the erythrocyte sedimentation rate declined to 45 mm. per hour by February 11. During the first week of penicillin therapy he developed a short systolic murmur at the apex, which disappeared again as he improved otherwise. The PR interval increased from 0.13 second on admission to

August 1929. A mild sore throat on Jan. 7, 1944 was followed in two weeks by pain and stiffness in both ankles. The day prior to entry, substernal pressure was noted.

On admission the temperature was 103.9 F., the pulse rate 116, and respiratory rate 22 per minute. The right shoulder, hip and left knee were painful and tender. Both ankles were painful, tender, swollen, red and hot. The heart was slightly enlarged by percussion, and at the base a rough coarse, leathery sound was heard throughout systole. The blood pressure was 120/80.

The laboratory examination on entry revealed red blood cells 4,150,000, hemoglobin 79 per cent, white blood cells 10,450, erythrocyte sedimentation rate 119 mm. per hour, cultures of nasopharynx yielding many group A type 17 hemolytic streptococci, electrocardiogram essentially normal with a PR interval of 0.20 second and a rate of 120 per minute, x-ray examination of chest disclosing slight enlargement of the heart in its transverse diameter.

Course.—Penicillin, started the day after admission, was given by continuous intravenous drip for the first week and by the interrupted intravenous method during the second week. He received a total of 3,295,000 units during the two weeks of treatment. During the first twenty-four hours after admission the arthritis progressed to involve the right knee and then gradually receded during the next few days, so that by the fifth day of penicillin treatment the patient was asymptomatic with the exception of epistaxes. The erythrocyte sedimentation rate, however, remained high and he developed first degree heart block, which persisted until twelve days after the discontinuance of penicillin. On the ninth day of penicillin therapy mild arthritis recurred involving the knees, elbows and shoulders and persisted until nine days after this drug was stopped. By this time the patient was afebrile and the erythrocyte sedimentation rate had decreased to 65 mm. per hour. His convalescence was uneventful thereafter.

Although it is difficult to evaluate the effect of penicillin in this case, it would appear that this patient had a rather mild attack of rheumatic fever with a single cycle of activity so often seen in persons of this age group.

CASE 4.—History.—H. P., aged 24, was admitted on January 14, 1944 with his first attack of rheumatic fever. On December 18 he developed a sore throat. Two days later pain was first noticed in the left hip and foot and subsequently in both feet and knees. During the next fortnight the joint pains spontaneously subsided, and he felt well for about five days. On January 9 he again developed pain in both feet and two days later his ankles became swollen. On the day before admission both knees became swollen and painful, and slight precordial discomfort was noticed.

On admission the temperature was 103.4 F., pulse rate 107, and respiratory rate 26 per minute. The patient appeared acutely ill. Both elbows were slightly painful. The knees, ankles and metatarsophalangeal joints of both feet were painful, tender, swollen, red and hot. The heart was at the upper limits of normal in size to percussion and there was a low pitched systolic murmur at the apex and a soft systolic blow along the left sternal border.

The blood pressure was 134/75.

The laboratory examination on admission revealed red blood cells 4,670,000, hemoglobin 73 per cent, white blood cells 12,150, erythrocyte sedimentation rate 80 mm. per hour, cultures of the nasopharynx yielding group A type 30 hemolytic streptococci, electrocardiogram showing normal rhythm, rate 116 per minute, PR interval 0.20 second, T₁ upright, T₂ diphasic, T₃ negative and RT₂ segment elevated, x-ray examination of the chest disclosing the heart normal in size and shape.

Course.—On the day after admission penicillin therapy was started. During the first week the patient received 4,000 units intravenously at three hour intervals during the day and 25,000 units intramuscularly at four hour intervals during the night. Following the institution of penicillin treatment, the

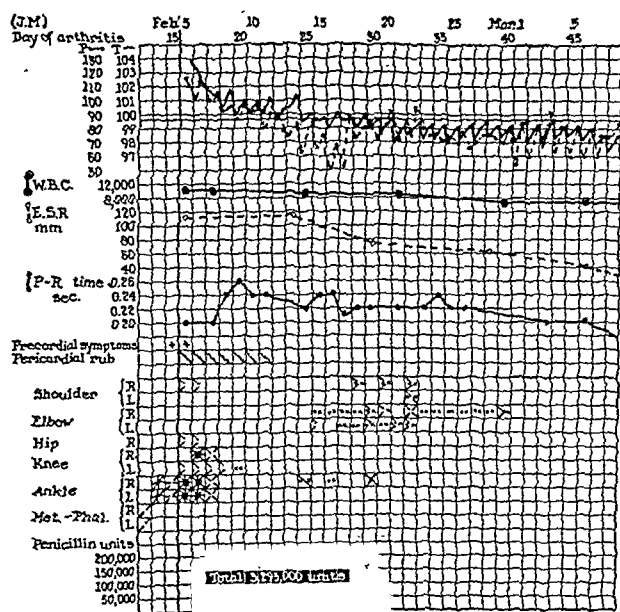


Chart 2.—Course in case 3.

0.17 second on January 24 and then again decreased to 0.13 second by February 11. At this time he was started on 9 Gm. of acetylsalicylic acid daily. About the middle of February he developed an intercurrent group A hemolytic streptococcal infection, but other than a slight fever and leukocytosis at this time and a transient rise in his erythrocyte sedimentation rate one week later there was no evidence of an exacerbation in his rheumatic activity.

Although this patient had a definite remission of his signs and symptoms during the early part of the penicillin treatment, he suffered an exacerbation later while still receiving the drug; this suggested that his disease was running a polycyclic course. Moreover, he still had signs of active infection when salicylates were started fifteen days after penicillin was stopped; and following the discontinuance of salicylate three months later, the erythrocyte sedimentation rate again became elevated, indicating persistent rheumatic activity.

CASE 3.—History (chart 2).—J. M., aged 31, was admitted on Feb. 5, 1944 on the sixteenth day of an attack of rheumatic fever. A previous attack of polyarthritis, probably due to rheumatic fever, lasting three to four weeks had occurred in

patient's arthritis involved progressively the right hand, wrist, both elbows, shoulders and the sternoclavicular and acromioclavicular joints. On the sixth day after starting treatment the erythrocyte sedimentation rate had reached 112 mm. per hour. His polyarthritis then rapidly cleared and the temperature fell to a normal level. During the second week the patient received 40,000 units of penicillin every three hours from 9 a. m. through 12 midnight. During this time the temperature did not exceed 100 F., the arthritis was much improved and the erythrocyte sedimentation rate decreased to 30 mm. per hour. Nine days after discontinuance of the penicillin he was afebrile, his white blood cell count was within the limits of normal and the erythrocyte sedimentation rate had decreased to 15 mm. per hour. He continued, however, to have some pain and tenderness in both elbows. Two days later pain recurred in both hips and the right knee and during the next forty-eight hours progressed to involve the spine and the left knee. He again became febrile; the white blood cells and the erythrocyte sedimentation rate increased. At this time 9 Gm. of acetylsalicylic acid was given daily, which induced a prompt disappearance of fever and arthritis except for slight pain and tenderness in the elbows which persisted for several weeks, although the erythrocyte sedimentation rate and white blood cells rapidly fell to normal levels.

As indicated by the history and hospital course, this patient's disease was probably polycyclic in type. Penicillin therapy was apparently started during the second cycle of activity, and the remission which occurred during the latter part of the treatment probably represented the natural course for his disease. The recurrence in activity following the cessation of penicillin treatment indicates that this drug was not effective in curing the rheumatic fever.

CASE 5.—History.—W. W., aged 20 years, admitted on March 1, 1944, had postscarlatinal arthritis when 14 years old and for many years had suffered attacks of paroxysmal tachycardia. About February 1 he developed nasopharyngitis. Three weeks later, and one week prior to his admission, pain in both feet, ankles and elbows occurred. On the day before admission the hips and shoulders became involved, swelling of the left knee appeared and substernal discomfort was noticed. On admission the temperature was 101.4 F., pulse rate 96 and respiratory rate 28 per minute. The patient appeared moderately ill. The elbows, hips and knees were painful and there were small effusions in both knee joints. The left foot and ankle were tender, painful and hot. Examination of the chest revealed slight dullness, with a moderate number of moist rales below the angle of the right scapula. The heart was slightly enlarged to percussion and there was a soft systolic murmur along the left sternal border. The blood pressure was 105/60.

The laboratory examination on admission revealed red blood cells 3,870,000, hemoglobin 84 per cent, white blood cells 11,250, erythrocyte sedimentation rate 47 mm. per hour, cultures of the nasopharynx yielding group A type 19 hemolytic streptococci, electrocardiogram showing left bundle branch block with a PR interval of 0.12 second, x-ray examination of the chest disclosing peribronchiolar infiltration at the right base, and the heart slightly enlarged in its transverse diameter.

Course.—On March 2, the day after admission, penicillin therapy was started and during the next two weeks he was given 40,000 units intravenously at three hour intervals during the day and 25,000 units intramuscularly at four hour intervals at night. During the two weeks of treatment he received a total of 3,404,000 units of penicillin. On March 3 the polyarthritis had increased and the erythrocyte sedimentation rate was 52 mm. per hour. It was therefore decided to give him enough salicylates to eliminate the fever and to render him asymptomatic and then withdraw this drug while he was receiving continuous penicillin therapy; hence he was given

1.5 Gm. of acetylsalicylic acid every four hours for three days. Within eight hours after this treatment was started the temperature returned to normal, and within twenty-four hours he was asymptomatic. When the salicylates were discontinued, however, no rheumatic manifestations reappeared and he made an uneventful convalescence. Except for minor changes in the form of the complexes, his electrocardiograms remained essentially unchanged. It was felt that this electrocardiographic abnormality was not related to his rheumatic fever but that the patient probably suffered from the syndrome described by Wolff, Parkinson and White.¹⁰

This patient apparently suffered a mild attack of rheumatic fever with a single cycle of activity which was broken by the salicylate therapy; hence it is very difficult to appraise the value of the penicillin treatment.

CASE 6.—History (chart 3).—J. C., aged 20 years, was admitted on Feb. 4, 1944 on the eighth day of a second attack of rheumatic fever. At the age of 9 he had an attack of polyarthritis. About four weeks and again one week prior

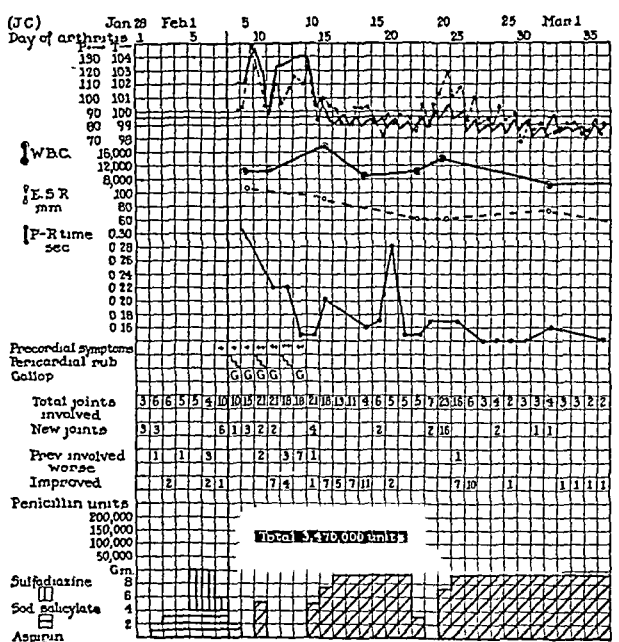


Chart 3.—Course in case 6.

to his present illness he suffered upper respiratory infections with slight fever and malaise. During the week before admission he had migratory polyarthritis involving the feet, ankles, knees, hips, spine and shoulders. He was given 18 Gm. of sodium salicylate and 8 Gm. of sulfadiazine during the six days prior to hospital admission.

On admission the temperature was 102 F., pulse rate 92 and respiratory rate 24 per minute. The patient appeared acutely ill. The right elbow and shoulder were painful and there was slight stiffness of the left elbow. There was pain and tenderness over the right acromioclavicular joint and both hips. Both knees were red, tender, swollen and hot, and the right ankle and the metatarsophalangeal joints of both feet were painful and tender. The heart was slightly enlarged to the left, and at the apex a third sound was heard early in diastole but no murmurs were present. Along the left sternal border there was a definite pericardial friction rub. The blood pressure was 120/70.

The laboratory examination on admission revealed red blood cells 3,790,000, hemoglobin 78 per cent, white blood cells 11,050,

10. Wolff, L.; Parkinson, J., and White, P. D.: Bundle Branch Block with Short PR Interval in Healthy Young People Prone to Paroxysmal Tachycardia. *Am. Heart J.* 5: 685-704 (Aug.) 1930.

erythrocyte sedimentation rate 111 mm. per hour, cultures of nasopharynx yielding group A type 19 hemolytic streptococci, electrocardiogram showing first degree heart block with PR interval greater than 0.32 second, x-ray examination of the chest disclosing accentuated lung markings with a small amount of fluid in the left costophrenic angle, the heart being slightly enlarged in its transverse diameter.

Course.—On the day after admission, penicillin therapy was started with five intravenous injections of 40,000 units each every three hours during the day and two intramuscular injections of 25,000 units at four hour intervals at night, making a total of 250,000 units daily for the first week. During the second week he was given six injections of 40,000 units intravenously daily. Over the fourteen day period he received 3,470,000 units of penicillin. Within thirty-two hours after penicillin was started the patient's temperature had reached 104.7 F. and the arthritis had progressively involved practically every joint. Therefore 4.8 Gm. of acetylsalicylic acid was given over a period of nine hours, which induced a drop in the temperature to 99.6 F., with definite symptomatic relief. Within twenty-four hours after the salicylates had been discontinued,

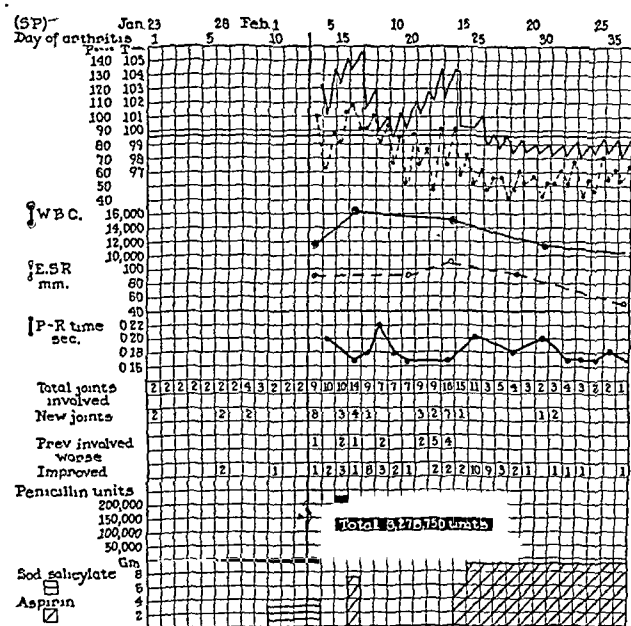


Chart 4.—Course in case 7.

however, the temperature returned to 103.4 F. and all joint manifestations recurred despite continued penicillin therapy. During the next two and one-half days the high fever and severe polyarthritis persisted. On the sixth day of penicillin therapy 4.8 Gm. of acetylsalicylic acid gave only slight relief, and on the next day the dose was increased to 9 Gm. daily with a prompt drop in temperature and relief of symptoms. This dose daily for the next six days kept the temperature below 100 F. and the arthritis in abeyance. A second withdrawal of salicylates on February 18, while the patient was still receiving penicillin, resulted in a recurrence of both fever and polyarthritis within twenty-four hours. By this time he had received a total of 3,470,000 units of penicillin without apparent benefit; hence this drug was discontinued, and the daily dose of 9 Gm. of acetylsalicylic acid was resumed with another prompt drop in the temperature and relief of symptoms. This medication was then continued for approximately nine weeks, about two weeks after all laboratory data had become normal. His subsequent convalescence was unremarkable.

It is clear that each time this patient received salicylates in sufficient dosage he obtained prompt symptomatic relief, but on withdrawal of salicylates while he

was on continuous penicillin therapy all signs and symptoms of rheumatic activity promptly recurred. It therefore appeared that his disease was not altered by the penicillin.

CASE 7.—History (chart 4).—S. P., aged 21, was admitted on Feb. 4, 1944, the thirteenth day of his first attack of rheumatic fever, which had been preceded by upper respiratory infection on Dec. 7, 1943 and Jan. 15, 1944. Although several episodes of epistaxis had occurred on December 26 and 27, pain in the arches of his feet first appeared on January 23, forty-eight days after the first and eight days after the second upper respiratory infection. The pain increased progressively during the next eleven days and involved also the ankles and knees. The patient had received 13 Gm. of sodium salicylate during the four days prior to hospitalization.

When admitted he appeared acutely ill, with a temperature of 103.2 F., pulse rate 100 and respiratory rate of 22 per minute. There were stiffness in the shoulders, elbows and wrists and slight pain and tenderness over the lower dorsal and upper lumbar spine. The right knee and ankle were painful, tender, swollen and hot. There was a small effusion in the right knee. The heart was slightly enlarged to the left and a soft prolonged, low pitched systolic murmur localized to the apex was present. The blood pressure was 120/75.

The laboratory examination on admission revealed red blood cells 3,930,000, white blood cells 10,950, erythrocyte sedimentation rate 87 mm. per hour, cultures of nasopharynx yielding group A type 36 hemolytic streptococci, electrocardiogram being essentially normal with a PR interval of 0.20 second, x-ray examination of the chest disclosing the heart enlarged in the region of the left ventricle.

Course.—On February 5, the day after admission, penicillin therapy was started with approximately 250,000 units daily by the continuous intravenous drip. Because of thrombophlebitis this form of treatment was discontinued after the first week, and during the second week the penicillin was given intravenously every three hours. He received a total of 3,278,750 units during the two week period. Forty-eight hours after penicillin was started the temperature had reached 105 F. and the polyarthritis had increased in severity. Because of the hyperpyrexia he was given 6.4 Gm. of acetylsalicylic acid over a period of nine hours with prompt symptomatic relief and drop in temperature. Following the withdrawal of salicylates the fever recurred, and polyarthritis again increased in severity despite continuous penicillin therapy.

On the sixth hospital day the electrocardiogram showed first degree heart block with a PR interval of 0.22 second, and on the next day the T waves in leads 1 and 2 became inverted. On the tenth day of penicillin treatment the erythrocyte sedimentation rate had increased to 111 mm. per hour, the temperature was 104 F. and severe polyarthritis was present. On the following day the patient developed temporary nodal rhythm with intraventricular heart block. Because it seemed unwise to withhold salicylates longer he was started on 9 Gm. per day, with a prompt drop in the temperature and pronounced symptomatic relief. Salicylates were continued in this dosage for six weeks, when the erythrocyte sedimentation rate reached a normal level. Attempts were then made to reduce the dose of salicylates, but pain and tenderness recurred in both shoulders, and it was necessary to return to the original dose to keep the patient comparatively symptom free for another two months. It thus seems probable that the penicillin failed to alter the course of this patient's disease.

CASE 8.—History (chart 5).—N. L., aged 21, was admitted March 2, 1944, on the fourth day of an attack of rheumatic fever. Nasopharyngitis on February 12 was followed in sixteen days by severe pain in both shoulders and substernal pressure. Arthritis then progressively involved both elbows, hips, knees and ankles.

On admission the temperature was 104 F., pulse rate 120 and respiratory rate 28 per minute. Pain and tenderness were noted in the right sternoclavicular joint, both shoulders, elbows, knees, ankles and the right hip. The heart was enlarged.

the left. At the apex a presystolic thrill was felt and a low pitched murmur was heard late in diastole. A systolic murmur, poorly transmitted to the axilla, was also present. The first sound at the apex was snapping in character, and at the base the pulmonic second sound was accentuated and greater than the aortic second sound. The blood pressure was 120/70.

The laboratory examination at entry revealed red blood cells 3,670,000, hemoglobin 74 per cent, white blood cells 13,650, erythrocyte sedimentation rate 118 mm. per hour, cultures of the nasopharynx yielding no hemolytic streptococci, electrocardiogram showing normal rhythm, rate 115 per minute, PR interval 0.20 second, T₁ upright, T₂ diphasic, T₃ upright; x-ray examination of the chest disclosing the heart enlarged in its transverse diameter with a straight left border and prominent pulmonary conus, the lungs with hilar vascular shadows enlarged, suggesting pulmonary congestion.

Course.—Although the patient gave no previous history of rheumatic fever, the classic signs of mitral stenosis indicated earlier experience with the disease. Because of the severity of the attack and the early signs of cardiac failure, the patient was started on 9 Gm. of acetylsalicylic acid daily on admission. Penicillin therapy was started on the day after admission with intravenous injections of 40,000 units every three hours during the day and intramuscular injections of 25,000 units every four hours at night. The patient received a total of 3,390,000 units of penicillin during the two weeks of treatment. On the first day of penicillin therapy pulmonary edema appeared, hence the patient was digitalized rapidly, given a diet containing 2 Gm. of salt daily with limited fluids, and placed in an oxygen chamber. The signs and symptoms of cardiac failure responded quickly to this regimen. Because of mild salicylism, aminopyrine was substituted for acetylsalicylic acid on the fourth hospital day and was well tolerated in daily doses of 4.5 Gm. Following the institution of salicylate therapy and then aminopyrine, the temperature fell to normal, the pulse rate slowed and the arthritis decreased definitely. During the second week of penicillin therapy, however, the arthritis increased in severity and several new joints became involved. This cycle of polyarthritis persisted during the week following cessation of penicillin, then decreased; but a third arthritic cycle occurred a few weeks later and a suggestive one a month later while the patient was receiving full doses of aminopyrine. The high erythrocyte sedimentation rate began to decrease in about three weeks and reached normal six weeks after discontinuance of penicillin treatment. The patient's condition began to improve at this time and the weight to increase; convalescence was well established, with only slight pain, tenderness, and stiffness remaining in a few joints. Signs of both mitral stenosis and insufficiency remained; but whether they were more evident than before the present attack of rheumatic fever it is impossible to state.

While the necessity for both antirheumatic medication and digitalis in this patient may have obscured the effect of penicillin, the cycles of arthritis both during and after penicillin therapy indicated that this drug had little if any effect on the course of the patient's disease.

ADDITIONAL OBSERVATIONS

Samples of blood were taken of all patients at varying intervals after the injection of penicillin to determine the concentration of the drug in the patient's serum. These samples were obtained at various times during the periods of treatment, so that the one-half hour level may have been determined on one day, the one hour level on another day, and so on. The variation in the rate of excretion of penicillin from day to day in the same individual probably accounts for the fact that in case 7 in the table the one-half hour, one hour and two hour blood levels were the same, and in case 3 the two hour and three hour blood levels were similar. In addition, the strains of group A hemolytic streptococci recovered on culture from the nasopharynx of 6 of the 8 patients

were tested for their susceptibility to penicillin in vitro. The results of these tests and a summary of the serum concentration of penicillin obtained on each patient are presented in the table. From these data it is apparent that all of the hemolytic streptococci recovered were susceptible to penicillin in concentrations much below the concentration maintained in the patient's blood serum during most of the period of treatment.

It may also be significant that the nasopharyngeal cultures of the 6 patients that were positive for group A hemolytic streptococci on admission became negative for these micro-organisms within a very short time after treatment with penicillin was started and remained negative after this drug was stopped. It is realized that this does not necessarily indicate that streptococci in deeper tissues such as the cervical lymph nodes were completely eliminated by the therapy.

Determinations of the antistreptolysin O and antifibrinolysin titers were made on the serum and plasma

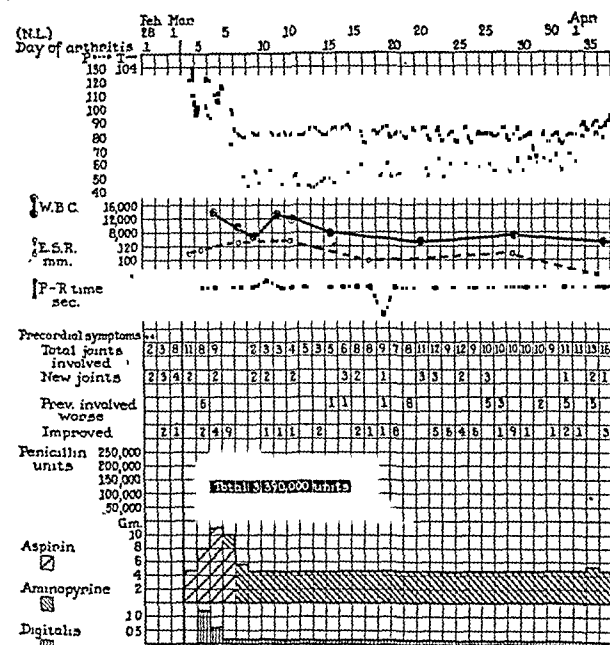


Chart 5.—Course in case 8.

respectively of all patients at weekly intervals during the course of study. The titration curves for both determinations followed courses similar to those that might have been expected among any 8 untreated rheumatic fever patients. The antistreptolysin O titers initially ranged between 100 and 1,200 units and in most instances increased moderately during the first one to two weeks of penicillin therapy and then remained stationary or began to fall slowly; but they usually persisted in an abnormal zone for several months. The antifibrinolysin titers of all the patients were 3 to 4 plus at the time of admission and usually remained elevated for several months.

In none of the 8 patients treated were any definite toxic manifestations to penicillin observed. Both patients 3 and 7, who received the drug by the constant intravenous drip method, developed mild thrombophlebitis. We do not believe, however, that this was necessarily due to the penicillin; it may have been due in part to the glucose solution, as previously pointed

out by Herrell.¹¹ Thrombophlebitis was not observed in any of the patients receiving more concentrated solutions of penicillin in isotonic solution of sodium chloride by vein at three hour intervals.

COMMENT

Eight young men with rheumatic fever have been treated for a two week period during the acute phase of their disease with penicillin. The total dose of penicillin varied from 1,975,000 to 3,470,000 Oxford units, and 7 of the 8 patients received over 3,000,000 units. The routes of administration were varied. Six of the 8 patients received the drug by the intramuscular and intravenous routes intermittently. The remaining 2 were given penicillin by constant drip for one week and then by the intermittent intravenous method for the second week.

All the patients were acutely ill with elevated temperatures and acute polyarthrititis and, in addition, 2 of them had pericarditis and 1 developed pulmonary edema the day after admission. There was no evidence that

maintain in the patient's blood a drug concentration greater than that required to inhibit the growth of the patient's own strain of streptococcus.

On admission to the hospital group A hemolytic streptococci were isolated on culture from the nasopharynx of 6 of the 8 patients. It was shown that 0.015 Oxford unit completely inhibited the growth of all 6 of these strains when this amount of penicillin was added to a culture containing from 1,000 to 5,000 bacterial cells. It was also shown that the concentrations of penicillin maintained in the patients' blood during most of the period of treatment were many times that required to inhibit the growth of the streptococci isolated from these patients. Another indication that the dose of penicillin was adequate is that the group A hemolytic streptococci were eliminated permanently from the nasopharyngeal mucous membrane of these patients within a short time after beginning treatment.

Whether or not penicillin would be effective in preventing rheumatic fever if given during phase I or II

The Amount of Penicillin Required to Inhibit the Growth of Streptococci Isolated from Patients and the Concentration of Penicillin in Their Serum

Case	Strains Isolated		Route of Injection †	Serum Concentrations of Penicillin * Oxford Units per Cubic Centimeter					During Intravenous Drip ‡
	Group Type	Oxford Units Inhibiting Growth *		Time After Injection					
				½ Hr.	1 Hr.	2 Hr.	3 Hr.	4 Hr.	
1. D. H.....	.....	.....	Intravenous	0.156-0.024	0.156	0.078	.....	.....	.....
2. M. K.....	A 24	0.015	Intramuscular	0.024	.....	.....	.....	.....	.....
			Intravenous	0.312	.....	0.078	<0.031	.....	.....
3. J. M.....	A 17	0.015	Intravenous	0.024	0.078	(1½ hr.) 0.031	0.031	.....	0.156
4. H. P.....	A 30	0.015	Intravenous	0.024	0.156	0.078	0.078-0.031	.....	.....
5. W. W.....	A 19	0.015	Intravenous	0.312	0.156	0.031	<0.031	.....	.....
			Intramuscular	.....	0.156	0.078	<0.031	<0.031	.....
6. J. C.....	A 19	0.015	Intravenous	0.024	0.312	0.156	<0.031	.....	.....
7. S. P.....	A 56	0.015	Intravenous	0.024	0.024	0.024	0.078	.....	0.156-0.024
8. N. L.....	.....	.....	Intravenous	0.312	0.156	0.078	<0.031	.....	.....
			Intramuscular	.....	0.156	0.078	0.031	<0.031	.....

* The inoculum for each test contained between 1,000 and 5,000 bacterial cells.

† Intravenous injections contained 40,000 Oxford units except in case 1, in which the dose was 25,000. Intramuscular injections contained 25,000 units.

‡ The constant intravenous drip solution contained 7.5 units per cubic centimeter and was regulated so that each patient received approximately 3,000 cubic centimeters in a twenty-four hour period.

penicillin altered the course of the disease in 7 of the 8 patients. It was difficult to evaluate the effect of this drug in the remaining subject (patient 5). On the second day of penicillin treatment he was started on 9 Gm. of salicylates daily with the object of rendering him afebrile and asymptomatic and then of withdrawing this drug while he was receiving continuous penicillin therapy. This patient made a prompt symptomatic response to salicylates but on withdrawal of this drug the signs and symptoms of rheumatic activity failed to recur; his erythrocyte sedimentation rate dropped to normal and he made an uneventful recovery.

It is now generally conceded that infection with group A hemolytic streptococci usually precedes and probably initiates the attack of rheumatic fever. It moreover appears possible that the hemolytic streptococcus is the only infectious agent involved in the etiology of the disease and that persistence of these micro-organisms in the patient's tissues may be responsible for the continued signs and symptoms of rheumatic activity. It was therefore desirable to know whether the dose of penicillin used was adequate to

cannot be answered as yet; but we do know that the sulfonamides are ineffective in this respect even when given at the onset of phase I. Until the foregoing question can be answered it seems that the chief value of the antibacterial drugs today with respect to rheumatic fever is in the prevention of the streptococcal infection which appears to induce the disease. It would thus seem that, once the preliminary streptococcal infection has started the mechanism leading to the onset of the rheumatic process in susceptible persons, the antibacterial agents now available do not materially alter the evolution of that mechanism. It must be admitted that we have no conclusive evidence that deep seated foci of streptococci may not exist in these patients in spite of their receiving large enough doses of penicillin to remove them from the accessible mucous membranes; for persistence of these micro-organisms could theoretically be responsible for the continued rheumatic activity.

CONCLUSION

Penicillin in doses ranging from 1,975,000 to 3,470,000 Oxford units given over a two week period to 8 young adults with acute rheumatic fever apparently failed to alter the course of their disease.

11. Herrell, W. E.: The Clinical Use of Penicillin, an Antibacterial Agent of Biologic Origin, J. A. M. A. 124:622-627 (March 4) 1944.

THE TREATMENT OF ACUTE RHEUMATIC
FEVER WITH PENICILLIN

MAJOR FRANK P. FOSTER

MAJOR GEORGE C. McEACHERN

CAPTAIN JOHN H. MILLER

LIEUTENANT COLONEL FRED E. BALL

LIEUTENANT COLONEL CHARLES S. HIGLEY

AND

MAJOR HARRY A. WARREN

MEDICAL CORPS, ARMY OF THE UNITED STATES

The probable relationship of Lancefield group A hemolytic streptococcal disease to rheumatic fever has led to the therapeutic trial of various antistreptococcal substances in this disease. Swift¹ and Jones² have described the effects of sulfanilamide in acute rheumatic fever. Swift³ and his co-workers⁴ have also reported the results of streptococcal antisera in this disease. Both of these entirely unrelated substances were found to be of no therapeutic value, and the evidence is suggestive that at times they may have been harmful. In view of these observations, when penicillin became available there was little cause for optimism that it would be beneficial in this disease.

However, because of the great need for a more satisfactory therapeutic agent for rheumatic fever and the knowledge that the value of penicillin in this disease would eventually need to be determined, it was felt that an organized study by producing an answer quickly and economically would, irrespective of the outcome, ultimately prove worth while.

ORGANIZATION OF THE STUDY

Three army air force installations having high incidence rates for acute rheumatic fever and representing three geographic areas were selected. At each of the three posts the same plan of study was followed. Patients selected for penicillin therapy were those who had characteristic joint disease and who presented sufficient additional evidence of rheumatic fever to make them entirely acceptable from a diagnostic standpoint. Patients were not included who had previously received salicylates or sulfonamides. Some were treated as soon as the diagnosis was made, and the remainder after a period of observation of two or three days. Routine blood studies and urinalyses were done. Erythrocyte sedimentation rates were obtained every other day and electrocardiograms every second or third day. A careful record was kept of changes in objective and subjective evidences of the disease. Throat cultures were made at frequent intervals in the majority of the cases.

From the Army Air Forces Rheumatic Fever Control Program, AAF Regional Station Hospitals at Buckley Field, Colorado (Majors Foster and McEachern), Kearns, Utah (Captain Miller and Lieutenant Colonel Ball), and Truax Field, Wisconsin (Lieutenant Colonel Higley and Major Warren).

1. Swift, H. F.; Moen, J. K., and Hirst, G. K. Action of Sulfanilamide in Rheumatic Fever, *J. A. M. A.* **110**:426-434 (Feb. 5) 1938.

2. Massell, B. F., and Jones, T. D. Effect of Sulfanilamide on Rheumatic Fever and Chorea, *New England J. Med.* **218**:876-878 (May 26) 1938.

3. Swift, H. F. Conferences on Therapy. Treatment of Rheumatic Fever, New York State J. Med. **42**:895-903 (Mar. 1) 1942.

4. Hitchcock, C. H.; McEwen, C., and Swift, H. F.; *Am. J. M. Sc.* **150**:497-514 (Oct.) 1930.

PENICILLIN DOSAGE USED

Penicillin was administered intramuscularly in doses of 25,000 units at three hour intervals for daily dosage of 200,000 units. In the majority of instances this dosage was continued for five days or until a total of 1 million units had been administered. The dosage was thus twice that ordinarily acceptable for the usual forms of beta hemolytic streptococcal infections.

INTERPRETATION OF RESULTS

Thirty-eight cases were studied. In 3 cases, because of the progression of the disease, the welfare of the patient made it necessary to stop penicillin and substitute salicylates before the completion of the five day period. The clinical impressions of the three groups of observers regarding the results of penicillin therapy are indicated in the accompanying table. A review of the recorded data reveals no consistent pattern which could be attributed to penicillin therapy. In the group of patients in whom the severity of the disease increased during penicillin therapy it was the opinion of the majority of investigators that penicillin was a contributory factor in this change. The possibility that this represents the natural course of the untreated dis-

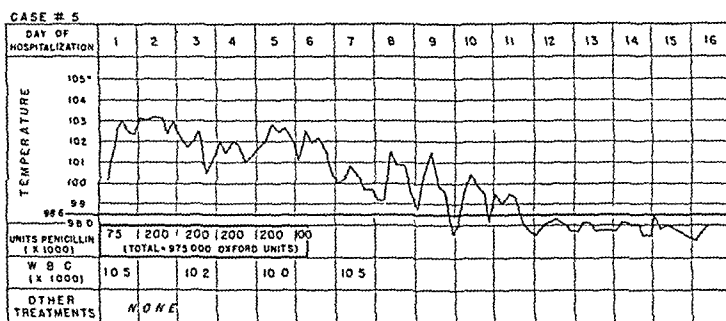


Chart 1—Acute rheumatic fever penicillin therapy given during a period of gradual improvement. Cessation of the drug produced no apparent change in the clinical course of the disease.

ease in these individuals cannot be excluded. The single case in which improvement appeared following penicillin treatment may similarly represent a spontaneous recovery not infrequently observed in the monocyclic form of the disease.

Clinical Evaluation of the Results of Penicillin Therapy
in Acute Rheumatic Fever

AAF Hospital	No Change	Increased Severity	Improved
A	5	5	0
B	3	4	1
C	11	9	0
	19	18	1

There were no changes in the electrocardiograms which could not be explained by the course of the disease. In 7 instances the erythrocyte sedimentation rate showed a temporary depression during the period of penicillin therapy. This has been observed also in other patients receiving conventional treatment. Two representative cases are illustrated in the accompanying graphs.

BACTERIOLOGIC STUDIES

In 21 cases throat cultures were taken on admission and one or more times during penicillin therapy. The initial culture in 19 was found to be positive for group A

hemolytic streptococci. In all instances the throat cultures became negative for this micro-organism during penicillin therapy. Seven patients were subsequently followed by serial throat cultures. In 1, the throat culture again became positive before penicillin therapy was terminated, in 1 case two days after termination and in the remaining 5 four weeks after termination. The hemolytic streptococci recovered at this time in the latter group of 5 patients were found to belong to different types than were found at the initial examination.

COMPLICATIONS

Urticaria appeared in 4 cases, lasting an average of three and three fourths days and appearing an average of fourteen days after penicillin therapy was started. Three of these episodes of urticaria were followed by increased joint pains and elevation of the pulse rate and temperature.

INITIAL ONSET OF ACUTE RHEUMATIC FEVER DURING PENICILLIN THERAPY

In addition to the cases described in which the therapeutic effect of penicillin in rheumatic fever was studied, 2 patients were observed who developed characteristic manifestations of acute rheumatic fever during the course of penicillin therapy for severe group A

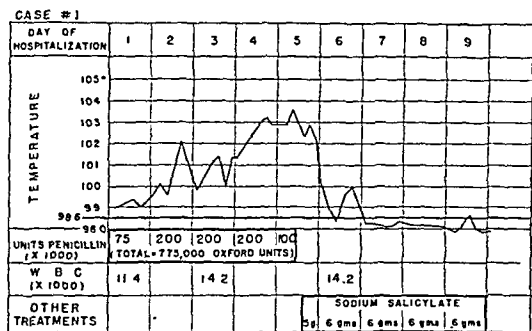


Chart 2.—Acute rheumatic fever progression of clinical disease during period of penicillin therapy, with prompt remission following a substitution of sodium salicylate.

hemolytic streptococcal infections. In these cases the joint manifestations developed two and four days respectively after the initiation of penicillin therapy and thus contrast to the allergic joint manifestations described. It therefore appears evident that penicillin exerts no beneficial influence in rheumatic fever when given after the establishment of the hemolytic streptococcal infection that apparently induces that disease.

CONCLUSIONS

1. A study of the value of penicillin therapy in 38 cases of acute rheumatic fever disclosed no evidence of benefit.
2. In some cases it appeared clinically that the course of the disease was aggravated.

Special Diabetic Food.—Special foods for the diabetic patient are seldom necessary. On the contrary, the effort today is to permit the patient as far as possible to eat the ordinary foods which come to the table, which, with the more liberal carbohydrate diets now in use and with the aid of insulin, is not difficult. There are the further objections that, while specially prepared diabetic foods are sometimes attractive, they are often unpalatable and they vary greatly in percentage composition. The claims made for them are sometimes misleading, and as a rule they are expensive.—McLester, James S.; *Nutrition and Diet in Health and Disease*, Philadelphia, W. B. Saunders Company, 1943.

PENTOTHAL SODIUM INTRAVENOUS ANESTHESIA IN PEACE AND WAR

THE FIRST TEN YEARS OF PENTOTHAL SODIUM INTRAVENOUS ANESTHESIA, JUNE 1934 TO JUNE 1944

R. CHARLES ADAMS, M.D.

ROCHESTER, MINN.

It usually takes several years to establish a new method in any field of medicine. This has been especially true of the introduction of new anesthetic agents and methods and of intravenous anesthesia in particular. The attitudes of different members of the medical profession to the introduction of new methods of anesthesia have often been diametrically opposite; the skepticism of some has been overbalanced by the unbounded enthusiasm of others. These widely divergent attitudes have not always worked to the best interest of the new method or agent. The history of the evolution of intravenous anesthetic agents amply bears this out.¹

In the case of intravenous anesthesia the skepticism on the part of many surgeons and anesthetists was not entirely without justification. For fifty years anesthetic agents had been introduced for intravenous administration, and only a few of them had produced uniformly safe and desirable anesthesia. Therefore, when pentothal sodium was introduced as another intravenous anesthetic agent it is understandable that many surgeons and anesthetists looked askance at the possibilities of its being of unusual clinical significance.

Pentothal sodium was introduced to clinical practice by Lundy in June 1934, so that this month marks the end of the first decade of its clinical use. While some of the ideas with regard to the use of the agent and method have changed, the original conception of its usefulness has been justified many times over, a fact which has been most gratifying to those of us who have had the opportunity to take a part in its development. Intravenous pentothal sodium anesthesia now stands on its own merits as an established method and has passed well beyond the experimental stages of its development.

However, each one of these ten years has brought about changes in our attitude toward the use of the method, its scope, administration and so forth. There are still many things that one should like to know about the pharmacologic action of pentothal sodium. The most important of these are its site of detoxication and the factors which influence its rapidity of detoxication in various persons. We are not at all sure that it is detoxicated by the liver, like its oxygen analogue pentobarbital sodium.

We are now convinced that pentothal sodium does not appreciably interfere with the function of the normal or damaged liver or kidneys and that it does not untowardly affect the metabolic processes of the body in general, provided it is administered with due regard to the patient's physical state.

In spite of the present day pharmacologic and clinical conceptions that have been generally accepted for pento-

From the Section on Anesthesiology, Mayo Clinic.
Read before the Section on Anesthesiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.
1. Adams, R. C.: *Intravenous Anesthesia: Evolution of the Method, Application in Clinical and Military Practice, and Consideration of the Use of the Barbiturates and Analeptics*, New York, Paul B. Hoeber, Inc., 1944.

thal sodium intravenous anesthesia, the opinions of those who have employed the method extensively are still widely divergent, particularly in relation to the types of surgical cases for which it is suitable. Some feel that it is applicable for almost any type of surgical operation. Others are of the opinion that certain limitations must be recognized unless it is used as an adjunct to some other method of anesthesia—particularly for major surgical cases.

Despite the diversity of opinion on the subject, it is possible to make a few general statements regarding the changes that have been made during the past ten years of its use in civilian surgical practice.

When the use of pentothal sodium was introduced, it was felt that its field should be limited to short and minor operations, requiring little or no muscular relaxation, the duration of which would be approximately fifteen to twenty minutes. Used in this manner as the sole anesthetic agent, its field of usefulness was comparatively narrow. Maximal doses were set between 0.5 and 1 Gm.

As physicians became more familiar with the action of pentothal sodium on patients with varying physical states and for different types of operations, many features of its application were clarified. It was found that the solution of pentothal sodium might be used with safety after it had been made up for periods as long as forty-eight hours. My associates and I have reduced the concentration of the solution from the original 10 per cent to 5 per cent and then to 2.5 per cent. This, we feel, has increased the margin of safety of the method and has reduced the incidence of intravenous or extravascular irritation from the solution to practically nil. Furthermore, it became apparent that comparatively long operations which did not necessitate much muscular relaxation could be performed safely and that many patients would tolerate total doses exceeding 1 Gm. if administered over longer periods.

At the same time, it was recognized that debilitated and toxemic patients had a lowered tolerance to pentothal sodium and took comparatively small doses to produce surgical anesthesia and that the administration to such patients must be carried out slowly and cautiously. The postoperative sleeping time was found to be more or less in direct proportion to the total amount of the drug administered, the amount of preliminary medicaments used and the capacity of the patient to detoxicate the drug. Additional observations revealed the fact that it was not a satisfactory method of anesthesia for most abdominal operations or for operations in regions where the reflexes were particularly hyperactive, such as those of the nose, throat, larynx and the anal region. Some anesthetists are of the opinion that pentothal sodium anesthesia is satisfactory for such operations and provides sufficient relaxation. We continue to feel that its use for major abdominal operations, unsupplemented, does not carry the margin of safety that may be attained by the use of some methods of inhalation or spinal anesthesia. In other words, the advantages that one hopes to derive are often outweighed by the disadvantages, if the operation is long and complicated and requires profound relaxation.

As a result of these findings the value of intravenous anesthesia in combination with other methods began to become apparent. The principle of such combinations was to take advantage of the desirable features

of pentothal sodium anesthesia without depressing respiration unduly and producing a prolonged postoperative sleep.

One of the important advances was the administration of oxygen during intravenous anesthesia. This served to decrease respiratory depression and to prevent anoxemia and seemed to favor better muscular relaxation and anesthesia using smaller doses of the drug than otherwise would be necessary. The oxygen may be administered by the ordinary face mask, B. L. B. mask, nasal catheter, nasopharyngeal tube or intratracheal tube.

The next step forward was the administration of 50 per cent nitrous oxide with the oxygen or if necessary as high as 70 per cent nitrous oxide. This serves to reduce further the amount of pentothal sodium required and increases the degree of anesthesia and relaxation. This combination of intravenous anesthesia with inhalation anesthesia has broadened the field of intravenous anesthesia and has increased its safety. The administration of oxygen or of nitrous oxide and oxygen is now routine at the Mayo Clinic during pentothal sodium anesthesia.

Combinations of other methods with intravenous anesthesia have been increasing during the last two or three years. This has been chiefly evidenced in its use with local or regional anesthesia. Among the purposes for which intravenous anesthesia may be combined with local or regional anesthesia are the following: (1) to render local infiltration and block anesthesia painless, such as during a block for bunionectomy; (2) during the course of an operation under local anesthesia if the patient is nervous; (3) to supplement local anesthesia that is wearing off or that is not quite adequate; (4) combined with block of the abdominal wall or intercostal block for abdominal operations in certain cases. These combinations result in adequate abdominal relaxation without one's having to employ large and depressing doses of pentothal sodium.

Similarly, intravenous anesthesia has been useful with spinal anesthesia for nervous patients who prefer to be asleep. Comparatively small doses will control nausea and prevent straining during the course of spinal anesthesia or to supplement spinal anesthesia that is wearing off.

Other combinations may be mentioned, such as the use of intravenous anesthesia as an induction to an inhalation or an ether anesthetic and its combination with topical anesthesia for certain operations about the throat, larynx and upper part of the respiratory tract. For certain operations about the head and neck its combination with nitrous oxide and oxygen administered intratracheally has been particularly useful. With an intratracheal tube inserted, a free airway is established and since none of the agents in this combination are flammable or explosive, a cautery may be used freely and without hazard.

As a result of all these things, the frequency of intravenous anesthesia has been gradually increasing in civilian surgical practice over these first ten years of its use. Owing to the combinations mentioned heretofore, pentothal sodium may now be used safely for many operations in which formerly we would have considered it contraindicated.

We continue to recognize certain contraindications. We do not consider intravenous anesthesia to be as

safe for young children as it is for adults. It should not be used for patients who have degenerative diseases of the myocardium, particularly if dyspnea is present. It is not as safe for operations in which the integrity of the airway cannot be assured as for other operations. One should always remember that intravenous anesthesia is another form of general anesthesia and that many of the complications that are associated with the latter can occur under intravenous anesthesia. We still feel that the method is safest when employed in institutional practice, although its use in the office or home is permissible provided the anesthetist has available equipment for establishing the airway and administering oxygen.

Having observed the progress that intravenous anesthesia has made in civilian practice over this ten year period, we have been extremely interested in what its value would be in army and navy medical practice in time of war. At the beginning of World War II we could only assume that it would play an important role for anesthesia in the armed forces. The simplicity of the equipment, the ease of transportation and its fire proof qualities were obviously in its favor, but we could not be sure how adequate it would be for robust soldiers and sailors or for patients in shock.

Doubts as to the safety of intravenous anesthesia for patients in shock were engendered in the minds of many at the very beginning of the war, when reports began to leak through from Pearl Harbor that its use had proved dangerous and even fatal in a number of such cases. At the same time, experience in civilian practice had convinced us that it could be used safely for many types of operations in such cases provided certain precautions were observed. Subsequent experience on the various battle fronts has corroborated the truth of this statement, the details of which may be summarized as follows:

1. A patient in shock, with or without loss of blood, is much more intolerant to pentothal sodium and requires much smaller doses to produce anesthesia than does the same man without shock. As a result, the effective dose of the drug is materially reduced—sometimes to as little as a fourth or a sixth of the usual dose. If this decreased tolerance as a result of shock is taken into consideration throughout the administration, satisfactory anesthesia may be obtained without producing severe respiratory depression or otherwise endangering the life of the patient.

2. Shock should be controlled, at least partially, before the anesthesia is begun. This maxim applies equally to other methods of anesthesia.

3. Previous administration of morphine should be known as to time of administration and size of dose, in order that a cumulative effect of two depressant drugs may not be superimposed.

4. Airways and oxygen equipment are as essential adjuncts to intravenous anesthesia as they are to inhalation anesthesia. Whenever possible, they should be available when the method is used.

The use of intravenous anesthesia for military surgery not only varies from its present use in civilian practice but also varies in the different types of surgical units within the services. In army or navy base or general hospitals its use parallels that in a civilian hospital. When it must be used in setups close to the combat area such as dressing stations, casualty clearing stations and

on the beaches, some of the standard criteria for, and contraindications to, its use must necessarily be subordinated to the urgency of the need for prompt treatment. Perhaps equipment is not readily available or the wounded man may have food in his stomach. In other words, through necessity, certain chances may have to be taken when the method is used under such circumstances.

However, the important consideration here is that the anesthetist has been sufficiently trained in the use of the method and effects of the drug so that he may judge how far he may safely go. The army and navy training programs in various departments of anesthesia throughout the country have been an important factor toward improving anesthesia in the armed forces. We have had letters from all over the world from physicians whom we have trained in our institution and from these reports I should like to draw some conclusions regarding the present status of intravenous anesthesia in military surgery at home and abroad.²

Before the United States entered the war we had obtained some information regarding the use of intravenous anesthesia in the surgical services of the British army and navy and for victims of bombing during the battle of Britain. From these reports it was learned that the method had been useful for preliminary débridement of bomb-burn victims and persons who had sustained minor war injuries. When shock was minimal, intravenous anesthesia did not appear to aggravate the shock further and some went so far as to say that its use appeared to protect somewhat against the increase of this state. Early reports from England bore out experimental work showing that pentothal sodium is not contraindicated when patients are undergoing treatment with the sulfonamide compounds. This is contrary to the former supposition.

Reports of the use of pentothal sodium from anesthetists in the armed forces throughout the world vary somewhat according to the type of hospital in which it is used. Most of the reports, however, tell the same general story: that pentothal sodium is of outstanding value. Statements such as "It's been a godsend," "We couldn't do without it" and "If I had to choose a single anesthetic agent, it would be pentothal sodium" are read from the letters of medical officers abroad every day. One officer who had spent eighteen months in the New Hebrides stated that "pentothal sodium has been a life-saver, used as the sole anesthetic in some cases or in combination with other anesthetics." Most of these reports come from physicians who are trained in anesthesia and who recognize its disadvantages and dangers as well as its advantages. These men recognize the fact that there are many types of injuries and operations in which the method may be hazardous and do not use it under such circumstances. While some comparatively recent reports have come through to the effect that the mortality rate under pentothal sodium anesthesia is higher than it should be, the men who are administering it on the battlefronts say that in most instances the fault lies in improper methods of administration and dosage and improper selection of cases.

I should like to sum up some of this information from the personal experiences of anesthetists in the

² Information quoted from the communications of army and navy medical officers is understood to represent the personal opinion of these officers and does not necessarily reflect the attitude of the army and navy medical services in general.

armed forces at home and abroad. A 2.5 per cent solution is generally employed, but where syringes are scarce 5 per cent solutions or 3.3 per cent solutions are sometimes used. When made up in quantity and kept from exposure to light and air, solutions up to seven and even to ten days old have been employed.

The percentage of cases in which pentothal sodium is used as the sole anesthetic agent or in combination varies. The average appears to be between 25 and 50 per cent. One officer in charge of anesthesia in an outfit immediately behind the front lines stated that, of 500 patients, 95 per cent received pentothal sodium anesthesia. Another, under similar conditions, said that in 78 per cent of operations, excepting those that were intra-abdominal, intravenous anesthesia was used. The distribution of 1,730 anesthetics administered in a base hospital in England over a six months period is shown in the accompanying table.

While the dangers of administering pentothal sodium to a shocked patient who has received a large dose of morphine must be kept in mind, intravenous anesthesia produces better results in robust soldiers or sailors if full doses of barbiturates, morphine and atropine are administered as preliminary medicaments, provided no shock exists. Satisfactory results have been reported by one officer for certain intra-abdominal operations when other methods were not available. In

Distribution of Type of Anesthesia

Type of Anesthesia	Percentage
Intravenous.....	41.6
Spinal.....	31.4
Regional.....	16.9
Inhalation.....	5.3
Combined.....	4.8

these cases thorough premedication and slow induction with pentothal sodium were used.

Total doses vary widely, but a possible average may be estimated to be between 1,000 and 2,000 mg. In 1 case 5.9 Gm. was used over a period of eight hours. This demonstrates a fact often repeated, that the total dose of pentothal sodium and its administration over several hours need not be a reason to discontinue its use if the patient's condition remains satisfactory throughout. Some very prolonged and extensive operative procedures are possible, provided a good airway can be maintained and if profound muscular relaxation is not essential. This is evidenced by the following report of a case of multiple fractures resulting from an airplane crash:

While the patient was under pentothal sodium anesthesia the following procedures were performed: open reduction of a compound fracture of the right humerus; suture of the ulnar nerve in the region of this fracture; open reduction of a compound fracture of the right olecranon and application of a cast; reduction of a fracture of the left radius and ulna with cast; reduction of fracture of right tibia and cast. These were done sixteen hours after the injury, shock was treated prior to the operation and 1,000 cc. of blood was administered during the operation.

The types of operations in which intravenous anesthesia has found most favor are too numerous to set down in detail. Most reports state that it is used in almost 100 per cent of orthopedic operations. It is used extensively for the débridement of burns, for skin

grafting, in most operations on the skin, in operations on the eyes and for most operations that do not involve the cranial, thoracic or abdominal cavity or the upper part of the respiratory passages.

Army and navy anesthetists seem to be fully aware of the advantages to be gained by intravenous anesthesia in combination with other methods. As in civilian practice, reports of its use with oxygen, with 50 per cent oxygen and 50 per cent nitrous oxide, and with local, block and spinal anesthesia are becoming routine. In those cases in which it is used for intra-abdominal operations it is supplemented by intracostal or abdominal wall block in most instances. It appears to be becoming more frequently used as an induction to general anesthesia, since it decreases the stage of excitation in some of these patients and also lessens the formation of mucus and secretion.

The fireproof qualities of pentothal sodium and its noninflammable supplementary agents are reported to be of decided advantage in the forward areas, on battle-ships, during bombings or when operations must be performed with emergency lighting equipment which might ignite a flammable anesthetic agent.

While administration of pentothal sodium is by trained medical personnel or under their supervision, it has often been found necessary to utilize the services of nurses or corpsmen, one medical officer supervising the administration of several intravenous anesthetics. Medical officers inform us that many of these corpsmen and nurses have been doing an excellent job, under the proper supervision, and have fulfilled a very useful purpose. The principles of safe administration of pentothal sodium are quickly learned by intelligent nonmedical personnel. The instruction in venipuncture, in this connection, has been of benefit to those who help the medical staff with the administration of plasma and intravenous fluids.

SUMMARY AND CONCLUSIONS

Pentothal sodium intravenous anesthesia has traversed the first ten years since its introduction. During each of these ten years its use has increased generally throughout the country. Knowing that it is an agent of unusual anesthetic value, many of us have purposely overemphasized certain precautionary measures relative to its method of administration, dosage and selection of cases for its use. This attitude, we believe, is justified in teaching the use of a new anesthetic agent, the administration of which is so simple, the effects of which are so rapid and the results so satisfactory in most cases. The trouble has been that in the past many of the potential dangers incident to its use for certain patients and for certain operations have been overlooked or have been outweighed by its desirable effects. It is under these circumstances that untoward effects have occurred which at times have resulted in justifiable criticism of its safety. Pentothal sodium intravenous anesthesia carries as wide a margin of safety as any established method of anesthesia if it is correctly administered and correctly applied. Those who have had a wide experience with the method have naturally found it a suitable method in more complicated surgical interventions than are generally considered to be within its scope. The most important advance has been the recognition of its potentialities when combined with other methods of anesthesia. These

combinations have increased both the scope and the safety of the method.

The value of the method in military surgery up to the present phase of World War II is more than gratifying. In the final analysis, the application of the method in military surgery does not differ materially from its use in civilian practice. The same principles apply to the two, with the exception that the anesthetist must take into consideration those additional factors inherent in war surgery—shock, loss of blood and often the lack of skilled help and equipment. The anesthetist must weigh these additional factors if he would apply the method to the best advantage. The use of intravenous anesthesia up to the present stage of World War II has even yet been too limited to permit one to draw definite conclusions. Its use in military surgery should provide much additional information for those who will use it in future years.

There is still much to learn about intravenous anesthesia, and no doubt our present attitudes will continue to be modified from time to time. Perhaps new and structurally different agents will be evolved which will completely alter our present opinions of the method. Until such changes do occur, one has in pentothal sodium an intravenous anesthetic agent of undisputed usefulness, which has probably resulted in the most significant advance in anesthesiology throughout the last decade.

ABSTRACT OF DISCUSSION

DR. ALICE McNEAL, Chicago: In the earlier work in Germany anesthetists determined the dose by the patient's weight. Dr. Lundy has changed it from a haphazard method to something that is as controllable as inhalation anesthesia. We are grateful to Dr. Adams for bringing up the subject of untoward effects. I have seen statements that there are no warnings and therefore no possibility to anticipate difficulties. I have had Dr. Adams's experience with the prolonged use of the anesthetic producing a depressing effect after the patient has been returned to the room. We have been using the drug for most vaginal operations. In the early period we were being called down a couple of times a week to see patients who were depressed. Now I have found how useful is Dr. Lundy's method of a combination of nitrous oxide with the drug, and I have reduced the amount of pentothal sodium toward the end of the operation and have had no further calls for resuscitation. I should like to ask Dr. Adams about the use of the anesthetic for operations on the head and neck. The more I see of it the less enthusiastic I am. I have discovered that no surgeon is to be trusted to watch the airway properly or to do something about it if he does interfere with it. So far I haven't attempted to use the drug for abdominal surgery when complete relaxation is needed.

DR. ROBERT A. HINGSON, U. S. P. H. S.: I wish to report 10,000 pentothal sodium administrations. They have been administered in a somewhat unorthodox fashion. Because of the shortage of help in our larger marine hospitals we have solicited the aid of nurse anesthetists and medically trained pharmacists' mates. In the latter series of 5,000 cases, administered chiefly by nurses and trained pharmacists' mates, there has been only one anesthetic death, whereas in the first 5,000 cases administered wholly by physicians there were two deaths. Individuals with the background of a nurse anesthetist or pharmacist's mate can be trained to use this technic. We have trained 36 pharmacists' mates who have gone to Coast Guard cutters throughout the North Atlantic, and on occasion these Coast Guard pharmacists' mates have performed magnificently where there was only one physician on a cutter of 150 to 200

men and an anesthetic was needed. We believe that pentothal sodium in their hands is one of the safest forms of anesthesia. We would like to substantiate all of the warnings that Dr. Adams has given. The group at the Mayo Clinic, in introducing this new agent, has always been fair in calling attention to the dangers as well as to the good points. I would urge individuals who report difficulty with this type of anesthetic to go to a clinic where it is being properly used. Only by such dissemination of information can we make final progress. Stimulation of the patient who has been overdosed can be accomplished by administration of 25 mg. of ephedrine in the vein just as promptly as with metrazol.

DR. S. A. SWENSON, Rushville, Neb.: In the hands of an expert there is little danger, although I think one death in 5,000 is rather high. That is about as high as with chloroform. We men out in the country using these methods of experts should use them with due care and with considerable awareness of the danger.

DR. HUGH A. CUNNINGHAM, Milwaukee: I have administered intravenous pentothal sodium 212 times over a period of twenty-six months to a woman aged 27. In the light of the early work on pentothal, this would be strictly contraindicated. This patient has at varying times received all of the sulfonamides. Her lesions were caused by *Bacillus necrophorus*, an anaerobe that travels by way of the lymphatics, leaving a necrotized area or a large abscess. Pentothal, as it was first introduced by Dr. Rovenstine, should not be administered more than every third to fifth day and should then be carefully watched. This patient frequently has had pentothal as often as twice a day, over an extended period of time. Since the thirty-third administration, periodic liver and kidney function tests have been taken. Over the last forty administrations she has demonstrated from time to time from 4 to 12 per cent dye retention in her liver function tests, but on a short rest she replaces this. She still has the disease; we are still using pentothal, so I would like to ask how often it can be repeated, what changes we should expect, and to how young a patient Dr. Adams has ever given pentothal.

DR. ARTHUR C. McCARTY, Louisville, Ky.: The Surgeon General of the Army has directed the medical officers to use greater care in the administration of pentothal sodium to avoid untoward results. A directive has been issued saying that pentothal must be limited to minor cases, shall not be used for operations around the head and neck, particularly when there is danger of hemorrhage into the respiratory passages when there is infection in that neighborhood, and in brain operations, prolonged operations, it shall be used rarely or with great caution. This is no news to experienced anesthetists, but obviously difficulties have arisen as the result of the use of pentothal in these circumstances. I am situated in a general hospital which is a neurosurgical center. We have found pentothal useful. One of the discussers mentioned the difficulty of controlling the airway in operations about the head. I have found it useful to pass an intratracheal tube, with the patient under pentothal anesthesia, cocaineizing the throat sometimes. At other times I use a local anesthetic in the lubricating solution; sometimes I use no supplementary anesthesia. I have found that the use of an intratracheal tube is of great assistance in controlling respiration in head operations, and it makes these much simpler and cuts down many of the complications that might otherwise arise from respiratory obstruction and from hemorrhage of the respiratory passages.

DR. HERMAN LENOWITZ, Maywood, Ill.: At a government hospital we have given 5,000 pentothal anesthetics with one death attributable to the drug. The man was in partial congestive failure before the anesthetic was given. We have used pentothal extensively for lesions about the head and neck and for genitourinary work as well as for orthopedic surgery. We do not hesitate to use pentothal in extensive prolonged operative procedures over a long period of time. We have

used as little as a few cubic centimeters of a 2.5 per cent solution and as much as 4.5 Gm. We frequently have occasion to work about the larynx. These are our troublesome problems, because the bleeding has to be controlled in some way, and we have found that by introducing an intratracheal tube and giving oxygen with a catheter the patient does very well. This is particularly true in total glossectomies and in lesions of the nasopharynx. We have discarded the use of the 2.5 per cent sodium pentothal solution. We find a weaker solution is just as effective and that it gives the same type of anesthesia. The control is better, the toxicity is less and the reactions of the patient are very few. We have modified this solution to 1:250, 1:500 or 1:1,000, depending on the purpose for which it is being used. We have used it in conjunction with a spinal anesthetic for an apprehensive patient who wants to be asleep, although we find that spinal anesthesia is the procedure of choice in this particular case. We use it extensively in amputations, in genitourinary work and in thoracic surgery. We do not use it in pneumonectomies or lobectomies, but in thoracoplasties we find it to be a desirable agent.

DR. STUART C. CULLEN, Iowa City: I want to ask Dr. Adams if he concurs in the opinion, expressed by a previous discussor, that the administration of pentothal (which includes a knowledge of the care of the airway, judgment as to its use in certain situations and an ability to remedy untoward reactions promptly and efficiently) is so simple that this agent and technic can be turned over to nonmedically trained persons for unsupervised use.

DR. R. CHARLES ADAMS, Rochester, Minn.: Dr. McNeal's question about the use of pentothal for surgery about the head and neck has been answered by Dr. McCarty. I agree with what he had to say. For extensive operations about the head and neck intratracheal anesthesia carries a wider margin of safety and control, particularly in regard to the airway, than does intravenous anesthesia. When it is necessary to maintain fireproof conditions, an intratracheal tube may usually be inserted under intravenous anesthesia without undue difficulty. This is facilitated by spraying the pharynx and glottic region with a local anesthetic solution. I have no argument with those who wish to use pentothal sodium as a sole anesthetic in abdominal surgery. I have not been able to provide most surgeons with the relaxation they prefer without using excessive doses of pentothal sodium and causing undue respiratory depression in most cases. Under these circumstances I feel that the advantages of intravenous anesthesia are outweighed by the disadvantages. However, by supplementing intravenous anesthesia with an abdominal wall or intercostal block, satisfactory anesthesia can be obtained without undue depression of respiration and without using a large dose of pentothal. In regard to the use of intravenous anesthesia for children, I feel that we have much better and more controllable anesthetics for children under 10 years of age than pentothal sodium. Dr. Cullen's question as to how long it takes to attain judgment in selecting suitable cases for pentothal anesthesia and when you can and when you cannot control the airway is apropos. I believe that its intelligent application requires considerable skill and experience not only with intravenous anesthesia but with other types of anesthesia for the many and varied types of operations. It would be hazardous to entrust the administration of pentothal sodium under these circumstances to nonmedically trained persons, particularly if they were not carefully supervised. To illustrate this point I will cite the case of a boy of 15 years with a little fibroma in his postnasal region for implantation of five or six radon seeds. Pentothal sodium was used, and after the operation had been completed the boy became cyanotic and stopped breathing. I visualized his glottis with a laryngoscope and pulled a large clot of blood out of the trachea, which had resulted in a complete respiratory obstruction and which would have caused his death if I had not had the equipment to remove it promptly.

CLINICAL OBSERVATIONS IN TYPHUS FEVER

WITH SPECIAL REFERENCE TO THE
CARDIOVASCULAR SYSTEM

MAJOR THEODORE E. WOODWARD

IN COLLABORATION WITH

MAJOR EDWARD F. BLAND

MEDICAL CORPS, ARMY OF THE UNITED STATES

This study was undertaken principally to observe the various physiologic changes occurring in typhus fever with special attention directed to the status of the general circulation. Previous descriptions of the disease frequently refer to cardiac collapse, cardiac failure or cardiac weakness and in areas where typhus is prevalent it is almost a routine procedure to administer cardiac stimulants in the form of digitalis, ouabain or perhaps some other substitute. Likewise, in certain sections cardiac drugs are given because of the extremely weak and toxic appearance of the patient with the thought in mind that these cardiac tonics will improve the circulation. The latter is not in accord with the actual physiologic effect of digitalis, and Luten¹ has shown that the only clinical indication for digitalis and drugs with digitalis-like action is "evidence of cardiac failure" and in certain arrhythmias. In our study there was no clear indication for cardiac stimulants and hence they were not employed. Actually there was evidence to suggest that a possible harmful effect might ensue from their use.

On the other hand little mention has been given to "peripheral circulatory weakness" with minimal stress directed toward its explanation or to this factor playing the major role, exclusive of the heart per se, as the real cause for this very apparent circulatory deficiency. Wolbach, Todd and Palfrey² mention 4 fatal cases showing irregular pulse which until death demonstrated no evidence of cardiac insufficiency. The very pathology of typhus suggests an overwhelming generalized involvement. The rickettsias invade the entire circulatory tree, causing swelling of the endothelial cells with actual thrombosis of the smaller and occasionally larger vessels. More commonly the changes are in the smaller vessels, causing multiple minute foci of necrosis (figs. 1 and 2). The typhus lesion has been especially well demonstrated in the skin, liver, kidney, cardiac and voluntary muscle and brain but also in every organ of the body.

Recent progress in handling the various forms of surgical shock³ indicates an increase of capillary permeability which alters the electrolytic composition of the blood, lowers the osmotic pressure by escape of plasma proteins into the tissues (lowering blood volume) and finally, when circulatory failure is established, creates a vicious cycle with resulting tissue anoxia accentuating the capillary damage. In typhus one does not have to

Major Woodward is attached to the United States of America Typhus Commission. Major Bland is assistant chief of the medical service, 6th General Hospital.

Capt. Daniel S. Ellis, M. C., of the 6th General Hospital, assisted in much of the clinical study. Major Eugene R. Sullivan, M. C., and Capt. Sedwick Meade, M. C., of the 6th General Hospital Laboratory, aided to a considerable extent in the technical investigation.

1. Luten, D.: *Clinical Use of Digitalis*, Springfield, Ill., and Baltimore, Charles C. Thomas, Publisher, 1936.

2. Wolbach, S. B.; Todd, J. L., and Palfrey, F. W.: *Etiology and Pathology of Typhus*, Cambridge, Mass., Harvard University Press, 1922.

3. Moon, V. H.: *Shock: Dynamics, Occurrence and Management*, Philadelphia, Lea & Febiger, 1942. Blalock, A.: *Principles of Surgical Care, Shock and Other Problems*, St. Louis, C. V. Mosby Company, 1940.

presume that there is capillary damage, because this is evident since the endothelial cell is the site of the specific lesion. The present study was outlined to evaluate the state of the circulation, to clarify the status of the "typhus heart" and to investigate the physiologic changes in the blood of severely ill patients.

PLAN OF STUDY

A ward was established in French Morocco to which patients were admitted as early in the illness as possible, regardless of prognosis. Thirty were studied, representing either severely or critically ill patients. After proper delousing procedures, base line studies were performed, following which the patient was put on a general supportive program. Along with the clinical studies fluid intake and output was observed with a check as to weight loss during the illness. Routine biopsy of the typical skin lesions was performed for



Fig 1.—Skin biopsy of a typhus lesion on the second day of exanthem. It shows swelling of the endothelial cells and a well defined perivascular cellular reaction (Giemsa)

future pathologic study. The diagnosis was established by (1) clinical findings, (2) Weil-Felix agglutination, (3) complement fixation with egg antigens,⁴ and in certain instances (4) virus isolation in guinea pigs.⁵

4. Castaneda, M. R.: Studies on the Mechanism of Immunity in Typhus Fever, *J. Immunol.* 31: 285, 1936. Bengston, L., and Topping, N.: Complement Fixation in Rickettsial Diseases, *Am. J. Pub. Health* 32: 48, 1942. Plotz, H.: Complement Fixation in Rickettsial Diseases, *Science* 81: 20, 1943.

5. It is universally accepted that a positive proteus (OX 19, OX 2, OX K) agglutination in rising titer is definite evidence of a rickettsial infection in certain localities where several such diseases occur (North Africa with epidemic and murine typhus along with *fièvre boutonneuse*). Clinical differentiation may be difficult and other laboratory procedures are necessary. The three fevers mentioned may occasionally give proteus agglutination with the OX strains, in which instance complement fixation helps. For example, serum from a case which "fixes" complement using a specific epidemic antigen is more than pre-umptive evidence of classic European typhus, whereas fixation with a specific murine antigen in high titer indicates murine infection. Serum from a case of *fièvre boutonneuse* produces negative results with murine and epidemic antigens but "fixes" complement using a Rocky Mountain spotted fever antigen (which coincides with the known antigenic similarities of these strains). An antiserum with pure *Rickettsia conorii* (*fièvre boutonneuse*) would be an additional aid in diagnosis.

CLINICAL OBSERVATIONS

Cardiorespiratory.—Examination of the heart revealed no enlargement, and this was confirmed by x-ray study in 12 instances. Heart sounds were commonly distant, being frequently masked by respiratory sounds, and in this series gallop rhythm and cardiac arrhythmias were consistently absent. In none of the cases was there engorgement of the neck veins or evidence of liver enlargement. Ascites was not observed. Cyanosis of the lips, ears, fingers and toes was a fairly common sign. Peripheral edema was noted in 1 instance on the dorsum of the feet, at which time the patient showed a lowering of plasma proteins (4.98 Gm. per hundred cubic centimeters), a secondary anemia, without concomitant signs of cardiac failure in the veins, liver or lungs.

The pulse at the height of illness was thready, of poor quality and usually in the neighborhood of 110 to 120. Patients responding poorly often had pulse rates of 130 or more and even at times imperceptible by palpation. Several patients with completely adequate circulation showed slightly increased rates even at the time of discharge, whereas in 4 cases a mild bradycardia of 48 to 60 occurred late in the second week of illness.

The pulmonary picture was dominated by varying grades of tracheobronchitis from a true bronchitis to a bronchiolitis. Circulatory congestion of the lung was not observed. Rhonchi and coarse, moist, sibilant and sonorous rales were frequently heard throughout both lungs without percussion impairment. Coughing, often persistent and bothersome, was for the most part non-productive, since the patient was often too weak to expectorate. Numerous sputum examinations revealed mixed flora with no one organism predominating. When these changes in the lung occurred along with the general circulatory picture of collapse, the patient appeared just as comfortable in the recumbent as in the sitting position, contrary to one suffering from pulmonary congestion of cardiac origin.

Blood Pressure.—Daily blood pressures indicated generally a definite drop of both systolic and diastolic readings, in some instances figures as low as 68/40 existing for variable periods. The lowered blood pressure often persisted well into convalescence, a normal figure being noted in many cases six weeks after illness when a follow-up examination was made. Occasionally normal levels were regained soon after defervescence of the acute illness, while a minority sustained adequate tension throughout the illness. Diastolic readings were consistently low, ranging from 40 to 60.

Peripheral circulatory weakness caused by lack of blood vessel tone and low blood volume, rather than cardiac insufficiency per se, most likely accounts for these changes. Avtsin⁶ observed this loss of vascular tone because epinephrine hydrochloride when instilled in the conjunctivas of typhus patients did not alter the vascular congestion whereas when instilled in normal conjunctivas prolonged paling occurs.

Venous Pressures.—Venous pressure was measured during the first and second week of illness, during early convalescence and in many cases daily and before and after intravenous therapy. Readings were consistently low, ranging from 2 to 12 cm. of water, the average of all cases being 8 cm. of water. In 1 case a preliminary reading of 20 cm. was observed on admission. This man was decidedly spastic and irrational, and it is

6. Avtsin, A. P.: Conjunctival Exanthem in Spotted Typhus, *Arch. Path.* 36: 158 (Aug.) 1943.

probable that this apparent initial elevation was the result of technical difficulties (spastic muscles) since all subsequent readings were normal and there was no evidence of congestion of the cervical veins or of the liver. The tests were performed frequently when the respiratory signs were prominent. Furthermore, no increase of venous pressure or of pulmonary congestion was observed after the intravenous administration of 1,000 cc. of fluid—a further indication of the absence of any important element of cardiac weakness in these otherwise seriously ill patients.

Electrocardiograms.—Electrocardiograms consisting of the standard limb leads were secured of 24 patients of this series during the most active phase of their disease, usually toward the beginning of the second week. In 4 instances a second tracing was made during convalescence for further study of certain abnormalities previously observed. To supplement this series we had an opportunity during the recent Naples epidemic (1944) to secure records on 14 additional patients also severely ill with typhus. Four of the latter group were in terminal coma at the time records were taken and died two to four hours later.

In general the electrocardiograms exhibited no striking deviations from the normal as regards high grade conduction defects or important T wave changes. However, certain relatively minor abnormalities were recorded with sufficient frequency (in 18 of the 40 patients, or 45 per cent) to warrant a comment: 1. Low voltage of the QRS complexes in all of the standard limb leads of less than 5 mm. deflection was recorded in 7 instances. In 2 additional patients there was slurring of the QRS complexes up to 0.10 second, but in no instance was well defined intraventricular block observed. 2. A delay in the auriculoventricular conduction time of slight degree (0.20 second or more) occurred in 6 patients, but in only 1 of these was the delay as much as 0.23 second. 3. Abnormally low T waves of less than 1 mm. in all leads were noted in 5, and in 2 additional patients there was depression of the ST interval of more than 1 mm. in all leads. 4. Auricular fibrillation with a relatively slow ventricular rate of 70 was recorded in a moribund patient who died two hours later. None of these patients had been taking digitalis or allied drugs.

These results are in accord with the clinical findings, which indicated that no serious disturbance of cardiac function per se appeared to be responsible for the circulatory phenomena previously discussed. A return to normal in the 4 patients in whom subsequent tracings were made during convalescence suggests that these minimal and transient electrical abnormalities are probably comparable in patients severely ill with pneumonia, with typhoid and with uremia.

Röntgenography.—We were unable to take routine films on every patient because of technical difficulties, but of the 12 examined cardiac enlargement was not encountered. One patient with a well sustained mitral systolic murmur presented slight prominence in the region of the pulmonary conus. This murmur was heard at the onset and was masked slightly during the illness by the pulmonary picture of tracheobronchitis, but during convalescence and eight weeks after departure from the hospital it was still present with radiation toward the axilla. Electrocardiographic changes in this man of slight left axis deviation and a PR interval of 0.22 second suggested a concurrent rheumatic infection. In most of the films of this as well

as of other patients the pulmonary fields were compatible with diffuse bronchitis and in 2 there were areas of localized infiltration of bronchopneumonia, but in none was there evidence of circulatory congestion.

CLINICAL PATHOLOGIC FINDINGS

Blood and Hematocrit.—In severe cases there was a drop in the red blood count of 1 million or more. Usually on admission the count was within normal limits, at which time the patient was severely dehydrated. Once hydration was accomplished, the red cells ranged from 2,500,000 to 3,700,000. The volume of cells ranged from 23 volumes per cent to 42 volumes per cent with the mean figure about 32 volumes per cent. All of the more severe cases presented, during the acute phase of illness, a volume of cells much less than normal. White blood cell counts were more consistently on the lower edge of normal (4,000 to 6,000), but in some cases counts of over 10,000 were found. Patients with pyogenic complications showed the higher counts. Differential smears were not remarkable.

Serum Protein.—A drop in the total protein level was not as striking as the corresponding deficiency of the

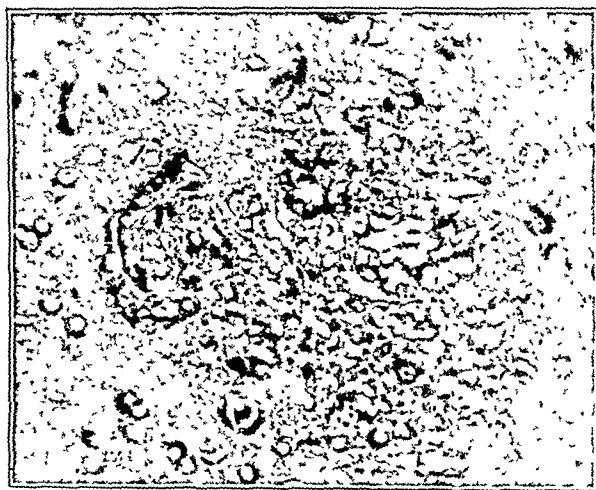


Fig. 2.—Typhus nodule in cerebral tissue of a fatal case. The perivascular elements are pronounced and the vessel is occluded by endothelial swelling and thrombus. (Giemsa.)

albumin fraction. The overall average for total protein was 5.2 Gm. per hundred cubic centimeters. Fibrinogen determinations were not done, but a drop of albumin and globulin elements was almost consistent and in a large percentage of patients the albumin:globulin ratio was reversed with albumin as low as 0.9 Gm. per hundred cubic centimeters. These findings were pronounced in the second week of disease and persisted well into convalescence. The smaller albumin molecule may well escape into the tissues because of altered capillary permeability, resulting in the edema which is occasionally observed. Several factors account for the reduced total protein figures; (1) lack of adequate protein intake, (2) altered hepatic function and (3) the available protein reserve being quickly expended by the disease process.

Chlorides.—This feature is reported by Julliard⁷ and was not adequately investigated in this study save for blood levels which were reduced and which could be elevated by oral and parenteral administration of

7. Julliard, J. and Henaff. Troubles du métabolisme hydrochlorure au cours des typhus épidémique et murin, Rev. ser. de san. mil 110: 197, 1939.

chloride. Blood levels varied from 70 milliequivalents per liter to 110 milliequivalents per liter. More work is needed to determine the persistence of this abnormality along with tissue analysis to clarify the fate of the chloride. Julliard has found the urine chloride low from early in illness and persisting until the first week of convalescence. This observer reports normal and urine chlorides in the murine typhus case.

Carbon Dioxide Combining Power.—In association with the chloride deficit, a state of alkalosis existed in these patients and the semicomatose cases often showed figures of 90 volumes per cent. In those less severely ill this determination was within normal limits, the lowest reading observed being 50 volumes per cent.

Urinalysis.—The urine evidenced few abnormal features. The specific gravity was normal, indicating that the kidney was able to concentrate well. In the first and early in the second week variable amounts of albumin appeared, never exceeding 2 plus amounts with the Robert technic. Frequently there was no albumin whatever. The p_H of urine ranged from 7.0 to 8.0. There were few cellular elements noted microscopically, with an occasional white cell and a very occasional red blood cell. Casts were almost never seen. Various forms of crystals appeared, the more common being calcium and amorphous and triple phosphates. Findings for proteose were inconsistent and urobilin was rarely elevated above normal, which indicates the absence of any active red blood cell destruction. Oliguria, commonly seen early in the illness in spite of an intake of 4,000 to 5,000 cc., often persisted until the middle of the second week, when a sudden diuresis frequently appeared. This fact alone is ample evidence of the profound state of dehydration and the need for active corrective measures.

Nonprotein Nitrogen.—Severely ill patients, on admission, without previous supportive therapy consistently showed an elevated nonprotein nitrogen, and early in the second week 90 mg. per hundred cubic centimeters was not uncommon. Comatose patients always presented this elevation but, once hydration was accomplished, chloride administered and urinary output sustained, this azotemia could be corrected, and in some instances a nonprotein nitrogen of 90 mg. per hundred cubic centimeters was lowered to 30 mg. per hundred cubic centimeters in three to four days. In less severe cases the nonprotein nitrogen was not remarkable.

In view of these findings it is difficult to explain the azotemia on a renal basis. Extrarenal azotemia is commonly seen in dehydration alone, but in typhus there are additional factors. The circulation is poorly sustained, so that reduced glomerular filtration pressure accompanies reduced arterial tension. The specific pathologic lesion causes widespread protein breakdown in the many minute areas of destruction in the muscle, brain and other tissues. Likewise a certain amount of hepatic dysfunction would tend to load the circulation with an excess amount of nitrogen waste. A small amount of endothelial damage is found in the typhus kidney, but hardly enough to explain the suggested renal embarrassment. Exhaustive renal function tests would be of immense value in evaluating the typhus kidney, to determine whether the azotemia is entirely of renal or extrarenal origin.

Spinal Fluid.—Lumbar puncture was done routinely. From the sixth to the tenth day of illness meningismus was commonly so pronounced in certain patients as to suggest a meningeal infection. The absence of Kernig's

sign was of great aid in the clinical differentiation. In agitated patients pressures of 240 to 260 mm. of water were seen. Pressures within normal limits likewise existed. In patients subjected to repeat taps the higher readings had returned to normal after five to seven days. Two instances of pleiocytosis were observed, 20 and 80 cells respectively, in each case the predominant cell being mononuclear. The Pandey test rarely showed more than traces of globulin. As previously reported by Blanc,⁸ strain isolations were attempted in those patients with the more pronounced central nervous system symptoms. Virus was not successfully isolated from the spinal fluid in spite of attempts as early as the fifth febrile day. In 1 instance isolation was tried simultaneously from blood and spinal fluid, the former being successful and the latter producing only a non-specific type of temperature curve in the guinea pigs.

Complications.—In this series complications were relatively uncommon. Several patients developed severe tracheobronchitis, with an inability to expectorate properly progressing into a patchy bronchopneumonia. One man developed a bilateral otitis media which in no way affected the progress of the disease. A middle aged woman developed a dry pleurisy which ran an acute course of four days and was otherwise not remarkable. Two women developed unilateral parotitis, 1 having been admitted with this infection. Both received adequate supportive measures of intravenous fluids when an adequate intake by mouth was difficult. In spite of the suggested harmful effects of the sulfonamide drugs on typhus⁹ small amounts of sulfadiazine were given with the possibility of preventing a bilateral parotid infection, which many times ends fatally. Sufficient urinary output was maintained during this period, and it was felt that little danger from the drug would follow. One of the women (T. B. A.) required surgery for her unilateral parotid abscess, at which time incision and drainage were done, *Staphylococcus aureus* being subsequently cultured. Both she and the other patient made complete recoveries. Phlebitis was seen in 1 case without further complication.

Deaths and Mortality Figures.—Of the 30 patients studied, 2 died. One, a woman aged 73 admitted late in the second week of illness, was hopelessly ill on admission and at the time of her death showed no evidence of cardiac insufficiency and her venous pressure was normal. Autopsy was not permitted. The other patient, a man of 25, died in an overwhelming toxic state with a generalized severe tracheobronchitis, with inability to expectorate mucus. Postmortem examination revealed a normal sized heart (350 Gm.), the lungs showing an early patchy bronchopneumonia with thick, yellowish, tenacious mucus expressed from the bronchi and bronchioles, the latter containing a mixed flora. Throughout the illness this man presented neither venous engorgement, liver enlargement, peripheral edema nor abnormal venous pressures.

In the hospital where this study was performed there were, from the period January to June 1943, 679 cases of typhus with 81 deaths, representing a mortality of 12 per cent. The highest monthly mortality was 15.1 per cent and the lowest 10 per cent. These cases may be considered by our standards to have received inadequate supportive therapy. Our series of 30 cases with 2 deaths represents a mortality of 6.6 per cent. It is

8. Blanc, G.: Recherches sur le typhus exanthématique poursuivies au laboratoire de Nîch d'Avril à Octobre 1915, *Bull. Soc. Path. Exot.* 9:5, 1916.

9. Durand, P., and Balozet, L.: Sérothérapie antityphique, *Arch. Inst. Pasteur de Tunis* 20:363, 1941.

difficult to attribute great significance to this lowering, but the assumption that adequate supportive therapy was a factor may be safely made.

SUPPORTIVE PROGRAM

The general supportive measures employed in these cases and suggested as a rational approach for support of the severe typhus case are as follows:

1. *Nursing*.—Attention to the mouth, care for the prevention of gangrenous skin lesions and the frequent changing of position to facilitate expectoration and to prevent pulmonary complications are most important. The use of sedatives for the agitated case is indicated.

2. *Adequate Fluid Intake*.—At least 4,000 cc. should be given daily, when possible by mouth. In the usual case, in spite of the extreme thirst, this amount may not be taken and the remainder may be given intravenously. This procedure is indicated when there is evidence of a poorly sustained circulation manifested by low arterial tension, a fast thready pulse and cyanosis, along with the evidence given by hematocrit and other studies. Large amounts of subcutaneous fluids are administered with difficulty to the typhus patient and tend to the development of soft tissue edema. Concentrated glucose (50 per cent) has been found useful for patients with oliguria and anuria.

3. *Blood Plasma*.—A small number of patients have been given transfusions of dried blood plasma and the effects have been excellent for supporting the circulation. This is a valuable means for restoring the depleted protein level.

4. *Chlorides*.—The ammonium and sodium salt have been used to improve the hypochloremia. From 2 to 4 Gm. of ammonium chloride was used along with 3 to 5 Gm. of sodium chloride. The ammonium salt is preferable.

5. *Diet*.—In severe cases in which efforts of high caloric drinks by mouth are not feasible, an indwelling stomach tube is of benefit. Nourishing protein and carbohydrate foods may be administered in this fashion to give considerable support to the patient. Vomiting is seen in the early stages of typhus but rarely during the actual course.

6. *Digitalis*.—This drug and other cardiac stimulants were not indicated in a single instance in this series, and we suspect that the indiscriminate use of these for patients as seriously ill as ours may occasionally be actually harmful. In the presence of congestive heart failure or auricular fibrillation with an uncontrolled ventricular rate the cautious use of digitalis combined with diuretic therapy (in the former instance) would seem a desirable adjunct to the general measures outlined.

7. *Sulfonamide Drugs*.—Small amounts were given in cases complicated by purulent infection, during which time satisfactory urinary output was maintained. No ill effects were observed.

8. *Iron*.—This is useful in convalescence for combating the secondary anemia.

SUMMARY OF FINDINGS

When the various clinical pathologic changes occurring during severe typhus are summarized, a fairly definite physiologic picture is evident. The patient is acutely ill and very toxic, with a significantly low arterial tension and a labile pulse. Usually unless actively supported the patient becomes dehydrated, the red cells decrease and plasma proteins fall with a con-

siderable loss of the albumin fraction indicating a reduced colloidal osmotic pressure. All factors indicate a drop of blood volume with the pattern of hypoproteinemia, hypochloremia and hemodilution without blood destruction. The unstable circulation results in lowered glomerular filtration pressure, and hence oliguria and anuria occur. The kidney, partially damaged by the specific pathologic condition and called on to eliminate an increased amount of nitrogenous waste, is unable to function normally unless adequately supported by fluids. Lowered blood volume means less adequate filling of the heart during diastole and hence lowered cardiac output. Each beat of the heart is less efficient. The use of cardiac stimulants under these conditions is ineffectual, but when the volume of the blood is restored the organ can operate more efficiently. For this reason it appears that cardiac drugs, except perhaps in exceptional instances, are contraindicated in typhus and once the blood volume is restored there is no indication for specific heart therapy unless unmistakable signs of cardiac failure exist, a condition that has not been observed in this series. Wolbach and his associates² have demonstrated the typhus lesion in heart muscle, the kidney, and for that matter in every organ of the body with relatively few exceptions. However, the degree of both cardiac and renal pathologic changes is in no way out of proportion to the changes occurring elsewhere, and from our clinical studies it seems unlikely that cardiac failure as such is often a significant factor in the outcome of the fatal case. It is not intended to convey the impression that the treatment of typhus is merely an automatic procedure and once blood chemical and abnormal physiologic processes are corrected that all is well. This is far from true. In typhus we are well aware of the central nervous system involvement with the profound effect of the rickettsial toxin¹⁰ not only on the brain but throughout the entire system. Our studies indicate that in the severe typhus case the chance for recovery is greater by observing and attempting to counteract the various clinical pathologic alterations.

CONCLUSIONS

From a detailed clinical laboratory study of 30 patients with severe epidemic typhus with special reference to the circulation, it has been shown that:

1. The altered circulation state, owing probably to widespread in severe cases, consists primarily of an inadequate circulating blood volume, hypoproteinemia (especially the albumin fraction), hypochloremia, hemodilution without blood destruction and an azotemia.

2. The circulatory collapse frequently encountered under these conditions is primarily of peripheral origin.

3. General supportive measures to increase the circulating blood volume are most beneficial.

4. Cardiac drugs (digitalis and allied preparations) are probably of benefit only in exceptional cases with clear evidence of congestive heart failure. This was not encountered in this study.

5. Further investigation is needed to clarify:

- (a) The blood electrolytes and tissue analysis to determine the fate of chloride.
- (b) Carbon dioxide combining power and the general alkali reserve picture.
- (c) Blood volume studies with the use of both whole blood and plasma in support of the reduced volume.

10. Otto, R., and Bickhardt, R.: Ueber das Gift der Fleckfiebrickett-sien. Ztschr. f. Hyg. u. Infektionskr. 123: 447, 1941.

REPORT OF CASES

CASE 1.—A youth aged 19 was admitted on the fifth day of his illness with a severe headache and an ill defined pink macular rash on the trunk and proximal parts of the extremities. There were coarse rales and rhonchi in the lungs and a normal cardiac contour without venous engorgement, gallop rhythm, palpable liver or peripheral or sacral edema. The spleen was

TABLE 1.—Clinical Pathologic Studies in Case 1

Day	Wbc	Rbc	NPN	Blood Chlo- rides	Serum Albu- min	Glob- ulin	Total	CO ₂	Cell Vol- ume, %	Ve- nous Pres- sure	Comple- ment Fixa- tion	Well- Felix
5th	.....	.....	29.6	106.1	2.90	2.52	5.61	....	32	13	0	0
6th	3,600	3.21	42.8	95.8	.....	.....	.....	.....	.....	.....	.....	.....
7th	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
9th	4,000	3.01	42.0	93.1	.....	.....	.....	.....	24	7	2/1/6	1/610
10th	5,100	2.60	.....	.....	.....	.....	.....	.....	.....	9	.....	.....
11th	.....	.....	28.0	87.2	1.43	3.95	5.42	.....	27	.....	.....	.....
15th	.....	.....	22.0	.....	.....	.....	.....	78.7	26.9	.....	4/1/192	1/320
21st	6,000	2.89	.....	.....	2.35	3.82	6.26	.....	23.5	.....	4/1/768	.....
31st	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4/1/192	1/100

easily felt. Until the eighth day of illness he was not severely ill but on that day the headache was more intense and he developed definite and pronounced cervical rigidity, with a negative Kernig's sign. He became completely irrational but would take fluids well. In view of his low blood proteins and a circulation not well sustained (tension ranging from 95/52 to 78/40) he was given transfusions of dried blood

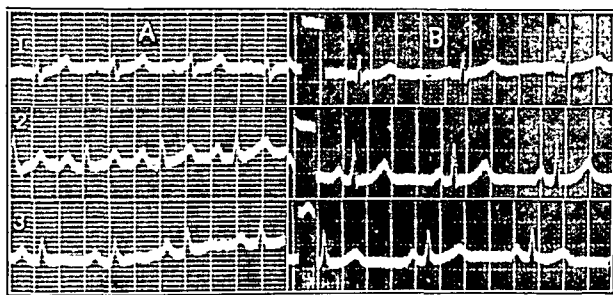


Fig. 3.—Tracings in case 1: A, on eighth day of severe typhus, showing low voltage of QRS complexes and a PR interval of 0.19 second. B, eighteenth day, during convalescence, showing normal voltage of the QRS complexes and a lessening of the PR interval to 0.15 second.

plasma of 250 cc. daily for four days along with an intake of 4,000 to 5,000 cc. of fluids orally. The urinary output was sustained throughout the illness on this regimen, along with the chloride mentioned previously. The rash was completely faded on the eleventh day. The mental lethargy persisted until the thirteenth day, with the temperature falling by lysis on the

TABLE 2.—Clinical Pathologic Findings in Case 2

Day	Wbc	Rbc	NPN	Blood Chlo- ride	Serum Albu- min	Glob- ulin	Total	Cell Vol- ume	Ve- nous Pres- sure	Comple- ment Fixa- tion	Well- Felix
9th	17,500	4.0	54.0	88.0	2.32	2.54	5.06	.....	11.5	4/1/24	1/640
12th	6,100	3.5	72.0	79.2	.....	.....	.....	.....	6.5	4/1/106	1/1280
13th	.....	.....	.....	.....	.....	.....	.....	.....	10.0	.....	.....
14th	.....	.....	26.0	.....	.....	.....	.....	.....	.....	.....	.....
18th	.....	.....	21.4	91.1	2.50	2.70	5.26	26.5	8.0	.....	1/1280
23rd	.....	3.3	.....	.....	.....	.....	.....	.....	.....	.....	.....
47th	.....	.....	.....	.....	.....	.....	.....	.....	.....	4/1/384	1/80

fourteenth day. During the illness the patient lost 16 pounds (7.3 Kg.). X-ray examination showed the heart and lungs normal. An electrocardiogram on the eighth day of illness showed a low voltage, which was normal on a recheck tracing on the eighteenth day. The PR interval during the acute illness measured 0.19 second but in the subsequent tracing had lessened to 0.15 second (fig. 3A and B). The diagnosis was confirmed by a rising titer of the Weil-Felix agglutination along with a positive complement fixation with an epidemic antigen. The clinical pathologic studies are given in table 1.

CASE 2.—A man aged 25, admitted on the sixth day of illness, was irrational and complained of a severe headache. There had been a slight cough from the onset of illness, which was present on admission. Dehydration was pronounced. There was a petechial type rash on the trunk, upper arms and thighs. The tongue was very dry, red and thickly coated. The conjunctivas were much injected, along with considerable suffusion of the eyes. The neck was decidedly stiff, with a negative Kernig's sign. The lungs were clear. The heart was normal without signs of cardiac embarrassment. The blood pressure was 84/60, the pulse rate 120. The liver was not enlarged. On deep palpation the splenic tip was felt. Following several days of an agitated state he developed severe mental lethargy, which persisted until the eleventh day. On this day he developed a bilateral otitis media. From the seventh to the tenth day there were spasmodic bouts of hiccuping, at which time the nonprotein nitrogen was elevated. The patient took orally from 4,000 to 5,000 cc. of fluids, supplemented when necessary by intravenous glucose-saline solution. Concentrated glucose (50 per cent) was given intravenously to help sustain the urinary output. Supplemental chloride was likewise administered orally. The cough, although not too bothersome, was present for ten days, being nonproductive and associated with rhonchi

TABLE 3.—Clinical Pathologic Findings in Case 3

Day	Wbc	Rbc	NPN	Blood Chlo- rides	Serum Albu- min	Glob- ulin	Total	CO ₂	Cell Vol- ume, %	Ve- nous Pres- sure	Comple- ment Fixa- tion	Well- Felix
8th	12,000	4.98	97.0	100.6	2.66	2.14	5.30	59.8	42	9.2	0	1/50
11th	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.2	.....	.....
12th	6,100	3.83	40.0	107.4	.....	.....	5.29	.....	31.8	.....	4/1/192	.....
14th	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.2	.....	.....
18th	6,900	3.7	28.0	105.7	.....	.....	6.61	.....	38	.....	4/1/1336	1/20
30th	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4/1/192	1/20

TABLE 4.—Clinical Pathologic Findings in Case 4

Day	Wbc	Rbc	NPN	Blood Chlo- ride	Serum Albu- min	Glob- ulin	Total	Cell Vol- ume	Ve- nous Pres- sure	Comple- ment Fixa- tion	Well- Felix
13th	10,000	5.02	53.2	72.2	1.29	4.11	5.31	11.2	.....	4/1/192	1/20

Scale of Values: Nonprotein nitrogen, milligrams per hundred cubic centimeters. Blood chloride, milliequivalents per liter. Serum protein, grams per hundred cubic centimeters. Carbon dioxide combining power, volumes per cent. Venous pressure, centimeters of water. Serologic studies represent the serum dilution. Well-Felix agglutination with Proteus OX 19. Complement fixation with an epidemic egg antigen.

and coarse rales. At no time were there signs of cardiac weakness. Slight edema on the dorsum of both feet was noted on the eleventh day of illness, at which time there was a reversal of the albumin:globulin ratio. The patient was clinically improved and regarded as "safe" on the twelfth day, when he was able to eat and perform voluntarily. The rash was completely faded on the thirteenth day, disappearing terminally on the legs. An electrocardiogram on the eleventh day showed normal voltage. The spinal fluid pressure on the seventh day was 230 mm. of water with 2 lymphocytes. A repeat tap on the seventeenth day revealed a pressure of 40 mm. of water, which was clear with 4 cells.

CASE 3.—A woman aged 25, Arabian, admitted on the eighth to the ninth day of illness in a severe condition, had a unilateral parotitis and a full blown petechial type rash of the usual distribution. She was dehydrated and had a dry filthy mouth and heavy brown coating on the tongue. The right parotid gland was diffusely enlarged, very tender and nonfluctuant. Flexion of the neck was moderately limited, the patient being in an agitated, moderately delirious condition. There were no signs of cardiac enlargement or failure. Occasional rhonchi were heard in the lungs. The blood pressure on admission was 94/72. The spleen was palpable and moderately firm. The patient was given the usual supportive care. The spinal fluid was found to be under normal pressure, with normal dynamics and clear fluid. Venous pressures on admission and throughout her illness were normal. The rash persisted until the fourteenth

day, when only faint pigmented spots remained. The agitation and delirium remained until the thirteenth day, but throughout the illness thirst was constant, so that the patient was able to take adequate oral fluid. She was given small amounts of sulfadiazine, with an initial dose of 3 Gm. and 2 Gm. daily, with the possibility of preventing a bilateral parotid infection, which would probably have resulted fatally. *Staphylococcus aureus* was subsequently cultured from this infection, since a fluctuant abscess was incised and drained on the seventeenth day. The patient made a complete recovery but after developing a phlebitis, late in convalescence, of the right femoral vein when she was under observation in a surgical ward. The course of the latter was uneventful. An electrocardiogram on the tenth day of illness showed the same low voltage with the PR interval 0.18 second. The urine throughout the illness was normal other than the presence of an abnormal amount of proteose present at the height of the parotid infection. Other findings are given in table 3.

CASE 4.—A white woman aged 73 was admitted on the twelfth to the thirteenth day of illness with pronounced delirium and in an almost completely comatose state. She had a petechial type rash, which was generalized and partially faded on pressure. There was dehydration, with a very dry mouth. Showers of moist rales and coarse rales were heard throughout the lungs, with a partially impaired percussion note posteriorly. The heart was not grossly enlarged, and the liver and spleen were not palpable. Gallop rhythm, venous engorgement, peripheral and sacral edema were absent. There was pronounced cervical rigidity. The respirations were noisy, shallow and rapid. She was obviously regarded as a critical case and was observed as a base line case since she was receiving cardiac and other stimulants by hospital authorities. A severe cough was nonproductive, and the tracheal and bronchial secretion was readily heard. Death came on the third day of hospitalization, and her case is presented because of the interesting physiologic changes. Venous pressure before death was 11.2 cm. of water with no visible evidence of cardiac decompensation. Unfortunately autopsy was not permitted. Other findings are given in table 4.

Clinical Notes, Suggestions and New Instruments

TICK BITE PYREXIA

LIEUTENANT COLONEL ISIDORE A. FEDER
MEDICAL CORPS, ARMY OF THE UNITED STATES

From May 2 to June 25, 1943, during Tennessee maneuvers, approximately 2,600 patients were admitted to the wards of our evacuation hospital. Hundreds of these patients presented dermatologic evidence of having been bitten by ticks. The present illness of most of these soldiers was in no way related to the tick bites. Many had symptoms which could readily be attributed to secondary complications of the tick bites, such as dermatitis due to local irritation and scratching, cellulitis, lymphangitis and lymphadenitis resulting from secondary infection. Seven patients were proved to have contracted tularemia, 3 showing a typical clinical course of this disease, the other 4 recognizable only by subsequent diagnostic titers of their serum in agglutinating *Pasteurella tularensis*.

A smaller group of patients was admitted whose essential complaint was fever, with or without chills. Associated symptoms included anorexia, malaise, headache and occasionally abdominal pain and vomiting. Physical examination was essentially negative except for the discovery of one or more engorged ticks attached to the skin. The only positive laboratory finding in 1 of the cases was a moderate increase in the percentage of the polymorphonuclear cells. Removal of the engorged ticks resulted in subsidence of the temperature and complete relief from the associated symptoms in from twelve to thirty-six hours. Further observation and subsequent serologic studies failed to reveal evidence of the development of any of the specific and recognized tick borne diseases. The

discharge diagnosis for these patients read "fever, simple, caused by tick bite." For the purpose of this article I have termed this condition "tick bite pyrexia" to differentiate it from the many other pathologic states which have been grouped under the heading "tick fever." The latter name has been used to cover a multitude of conditions. Nuttall¹ expressed his opinion many years ago that this name has lost its significance and should be dropped from our nomenclature.

The following are 5 illustrative summaries of the group of cases which came under observation for this syndrome. (All temperatures were taken orally.)

CASE 1.—A soldier was admitted May 7, 1943 with complaints of fever and pain in the abdomen of two days' duration, slight headache and moderate vomiting. Examination revealed slight tenderness in the right lower part of the abdomen. The skin showed signs of numerous tick bites. Two engorged ticks were found embedded in the right axilla. The admission temperature was 104 F. Blood and urine examinations were normal. The ticks were removed by touching a lighted cigaret to their caudal ends. That evening the temperature had fallen to 100.6 F., the following morning to 99 F. and for the next three days remained at a normal level. Coincident with the fall in temperature there was a subsidence of the complaining symptoms and the patient was discharged to duty on May 10.

CASE 2.—A soldier was admitted during the evening of May 8, 1943 with a history of fever, chills, generalized pains and vomiting of one day's duration. The temperature on admission was 104.6 F. Physical examination disclosed only slight lower right rectus muscle spasm. The total white blood cell count was 7,400 with 88 per cent polymorphonuclears. The following morning inspection disclosed an engorged tick attached to the right buttock. The tick was removed. The temperature remained elevated to 102 F. that day, but on the next morning it reached normal, where it remained for the next three days. There was a complete amelioration of the symptoms coincident with the fall in temperature. The soldier was discharged to duty on May 12.

CASE 3.—A soldier was admitted May 10, 1943 with complaints of fever, headache and generalized pains of one day's duration. Examination was essentially negative except for the presence of an engorged tick attached to the skin in the region of the right flank. The temperature on admission was 102.8 F. The tick was not removed. On the following day the temperature was still elevated to 102 F. The tick was now removed. Twelve hours later the temperature had fallen to 98.8 F. and remained within the normal range for the next three days. The patient was discharged to duty on May 14.

CASE 4.—A soldier was admitted May 11, 1943 with complaints of fever, chills, headache and backache of two days' duration. He stated that he had removed many ticks which had been attached to his skin. Physical examination was negative. The temperature was 101.4 F. The temperature subsided spontaneously and remained normal for thirty-six hours. On the evening of May 13 the temperature was again found to be elevated to 102.6 F. Reinspection of the skin disclosed an engorged tick embedded in the left axilla. The tick was removed. Thirty-six hours later the patient felt well and the temperature subsided to normal, where it remained for the following three days. The patient was discharged to duty on May 17.

CASE 5.—A soldier was admitted May 15, 1943 with complaints of fever, headache and malaise of one day's duration. He stated that he had removed 27 ticks from his body. Examination disclosed 2 engorged ticks embedded in the abdominal wall. An admission temperature was not recorded. The ticks were removed. About eight hours later the temperature was noted to be 97.2 F. and the patient stated that he felt perfectly well. He was discharged to duty on the following day.

COMMENT

Ticks are most prevalent during the months of May, June and July. All of our cases of tick bite pyrexia were observed during May.

1. Nuttall, G. H. F.: *Parasitology* 4: 88-93 (June) 1911.

The role of the tick in the transmission of specific disease processes has long been definitely established. The tick may serve as a simple carrier and mechanically transfer the disease agent, or it may furnish the site where the parasites grow or multiply during their residence in this vector. Thus the tick has been incriminated in the transmission of tularemia, relapsing fever, Rocky Mountain spotted fever and the allied group of diseases.

It has also long been felt that ticks may serve as direct agents of disease. An ascending paralysis beginning in the legs and occasionally fatal in its outcome, termed "tick paralysis," has been frequently reported in the more recent literature. Strong² states that it is believed to be caused by a venom secreted by the salivary glands of the tick during the period of rapid egg development. Abbott³ feels it is highly improbable that the cause of the paralysis lies with either a virus or a bacterium. It is more plausible that either a toxin or venom may be the underlying factor. The rapid disappearance of paralysis following removal of the ticks seems to confirm this hypothesis.

The rapid subsidence of the temperature and amelioration of symptoms when the engorged, embedded ticks were removed in our cases suggest a similar causative factor in the development of tick bite pyrexia. One would hardly expect such rapid recovery if the fever was infectious in origin. It is more likely that some toxic substance injected by the tick as it takes its blood meal is the factor responsible for the development of the symptoms. That the ticks have been attached for a prolonged period of time is evidenced by their engorgement. Not all ticks carry this fever producing toxin, for only few of the soldiers with attached ticks developed symptoms of this condition. The few ticks which we were able to examine proved to be females of the genus *Dermacentor*. Mackie⁴ states that "apparently *Dermacentor* ticks, in addition to producing tick paralysis, may in certain individuals cause a picture of chills and fever following tick bite." The exact manner in which the toxin or venom is produced in the tick is unknown, but it can be postulated, as in tick paralysis, that it resides in the female, is associated with the production of eggs and becomes evident only after the tick is partially or fully engorged.

TREATMENT

A director memorandum June 3, 1943 stated that "there is an indication of the need for preventive control of ticks by all military personnel. In the selection of bivouac sites, tick infested areas should be avoided if possible. Ticks should be removed from the body at least once daily. Careful examination of the body after coming from tick infested areas and on retiring should be routine."

Ticks should be looked for especially on the scalp, neck, axillary and popliteal regions, lower part of the back and the gluteal folds and in the umbilicus. They should be removed intact with a thumb forceps, gasoline or ether or by touching the caudal end of the tick with a hot burned end match or the lighted end of a cigaret. I utilized the latter method. Ticks should never be crushed with bare fingers. The site of the tick bite should be painted with iodine.

SUMMARY AND CONCLUSIONS

1. Tick bite pyrexia appears to be a definite syndrome resulting from the bites of certain ticks.
2. It is presumably caused by a toxin or venom secreted by the female tick rather than by a bacterium or virus carried by it.
3. Removal of the offending tick is followed by a rapid subsidence of the temperature and associated symptoms.
4. Careful examination of the body and removal of all attached ticks is essential for the control of this syndrome as well as for the control of tick paralysis and other specific tick borne diseases.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

During the October 1943 Council meeting it was decided that a status report on the prophylaxis of *Hemophilus pertussis* infections would be of much value for the physician. Accordingly, Dr. Harriet M. Felton and Miss Cecilia Y. Willard have prepared the following statement, which the Council has adopted for publication. The Council will now consider for inclusion in New and Nonofficial Remedies *H. pertussis* vaccines prepared according to the method of Sauer or of Kendrick and Eldermay or of Harrison and Bell.

AUSTIN E. SMITH, M.D., Secretary.

CURRENT STATUS OF PROPHYLAXIS BY HEMOPHILUS PERTUSSIS VACCINE

HARRIET M. FELTON, M.D.

AND

CECILIA Y. WILLARD, M.S.

PHILADELPHIA

In 1914 the Council on Pharmacy and Chemistry of the American Medical Association admitted pertussis vaccines to New and Nonofficial Remedies on the basis of what appeared at that time to be acceptable clinical evidence. During the next fifteen years these vaccines were used extensively for both prophylaxis and treatment. The reports, however, indicated that the results were not very satisfactory. Therefore in 1928 the Council voted to omit pertussis vaccines from New and Nonofficial Remedies with the close of the longest period for which any one had been accepted, unless new evidence proving efficacy was produced. Reports from different investigators continued to vary and in 1931 the Council¹ recommended that these vaccines be entirely omitted from New and Nonofficial Remedies.

It is interesting to note that in the same year one of the most important advances in the study of the pertussis organism was made. Leslie and Gardner² found that *Hemophilus pertussis* is a uniform species which, when grown on artificial mediums, passes through a series of antigenically different phases. Strains recently isolated from cases of whooping cough were designated as phase I. These strains are virulent for guinea pigs and serologically distinguishable from the variant non-virulent phases. Since this discovery the majority of vaccines have been prepared from freshly isolated cultures, although stock cultures are still used by some workers who claim that the organisms remain in the virulent phase I if they are grown under suitable conditions.³ It is quite possible that the varying reports on the use of the earlier vaccines were due in some measure to the lack of uniformity in antigenicity of the strains used in the preparation of the vaccines.

The reports on the use of the earlier vaccines were difficult to evaluate, owing to the fact that no adequate controls were included in the various clinical studies and that the vaccines used were of many types with poorly established, inadequate dosages. However, since 1933 there has been a succession of more careful clinical studies which seem to indicate that vaccines of greater

2. Strong, R. P.: *Stutt's Diagnosis, Prevention and Treatment of Tropical Diseases*, ed. 6, Philadelphia, Blakiston Company, 1943, vol. 2, p. 1495.

3. Abbott, K. H.: Tick Paralysis, *Proc. Staff Meet., Mayo Clin.* 18: 39-45 (Feb. 10) 1943.

4. Mackie, T. T.: Personal communication to the author, May 15, 1943.

1. Pertussis Vaccines Omitted from N. N. R., report of the Council on Pharmacy and Chemistry, *J. A. M. A.* 96: 613 (Feb. 21) 1931.

2. Leslie, P. H., and Gardner, A. D.: Phases of *Hemophilus Pertussis*, *J. Hyg.* 31: 423-434 (July) 1931.

3. Mushulov, L.: A Comparative Study of Agglutination Reaction of Pertussis Vaccination with the Sauer Type and with a Tricin Vaccine in Untreated Clinical Pertussis, *J. Pediat.* 9: 492-504 (Oct.) 1944.

efficiency have been prepared. In order to determine the current status of *Hemophilus pertussis* vaccines a summary of the most important of these studies will be presented.

The first encouraging reports on immunization were those of Madsen,⁴ who presented the results of two epidemics, in 1924 and 1929, in the Faroe Islands. The vaccine used was prepared by the Danish Sero-therapeutic Institute, Copenhagen, following the introduction of the cough plate method of diagnosis by Chievitz and Meyer.⁵ A forty-eight hour growth of freshly isolated organisms was rubbed into phenolized or formaldehyde treated saline solution to a concentration of 10 billion organisms per cubic centimeter of vaccine. The total dosage was 22 billion bacteria given in three injections at three to four day intervals.

In the first epidemic vaccination was begun after the disease had reached the islands. Here 2,094 children were vaccinated, and there were 627 unvaccinated children of similar age used as controls. The majority of both groups developed the disease, but there were only five deaths in the vaccinated group as compared with eighteen in the control group, or fatality rates of 0.24 and 2.9 per cent, respectively. It was concluded that while the vaccination was of no prophylactic value it greatly reduced the severity and duration of the disease. The records showed that the best results were obtained when the vaccination was completed one week before the onset of the disease.

In the second epidemic vaccination was completed shortly before the outbreak occurred. In this instance prophylaxis was found to be much better. There were 1,832 vaccinated children, of whom 75 per cent contracted whooping cough, but among 446 controls the incidence was 98.2 per cent. The fatality rates were 0.07 per cent and 1.8 per cent, respectively. It was thought that the favorable results were probably due to the fact that the vaccine was made from freshly isolated strains of *H. pertussis* and to the fact that the course of vaccination was completed shortly before the onset of the epidemic. In both epidemics the total number of bacteria in the immunizing dose of vaccine (22 billion) was larger than that used by others at this time (50 million to 3.5 billion).

In 1933 the first significant reports from the United States were published by Sauer.⁶ After obtaining uncertain results with the various commercial vaccines available between 1915 and 1925 he prepared a new type of vaccine, and the results of its use gave definite indication of a more effective product. The preparation of the new vaccine incorporated the principles suggested by Madsen and followed closely the criteria for phase I *H. pertussis* as described by Leslie and Gardner. From five to seven recently isolated, strongly hemolytic strains were used. The culture medium of Bordet and Gengou⁷ was modified to contain human blood instead of horse blood. A forty-eight hour growth of the organisms was scraped from the surface of the medium and suspended in phenolized saline solution in a concentration of 10 billion organisms per cubic centimeter of vaccine. It was found that the total dosage could

be increased to a total of 70-80 billion organisms without producing more than a transient local or systemic reaction. The first study included 394 vaccinated children. Of these, 162 were transiently exposed and 29 intimately exposed at some time between four months and four years after vaccination. There were 31 sibling controls for the intimate exposure group. Only 1 vaccinated child developed whooping cough (a mild case), whereas all of the intimate exposure controls developed the disease. In 1937 Sauer⁸ reported a series of cases from the Municipal Whooping Cough Prophylactic Clinic at the Health Center, Evanston, Ill. In a three year period 1,122 children were vaccinated. In this group there were 128 exposures, 94 of them intimate, with only 6 cases of whooping cough developing, a communicability rate of 4.7 per cent.

Probably the largest controlled studies on immunization against pertussis have been those of Kendrick and Eldering in Grand Rapids, Mich. Their vaccine⁹ was prepared from recently isolated cultures in phase I, as described by Leslie and Gardner. The criteria for accepting any particular culture for a lot of vaccine included (1) typical morphology and growth characteristics, (2) agglutination to high titer by antiserum of phase I organisms, (3) ability to produce phase I agglutinins in the rabbit and (4) development of hemorrhagic necrosis on intradermal injection into rabbits. These criteria for the preparation of pertussis vaccine were included in the recommended procedure of the Committee on Standard Methods of the American Public Health Association.¹⁰ Organisms were grown on Bordet-Gengou medium with 15 to 20 per cent human or sheep blood. The organisms were washed from the medium with saline solution, adjusted to a concentration of 10 billion organisms per cubic centimeter, centrifuged, and resuspended in saline solution containing either merthiolate 1:10,000 or 0.5 per cent phenol.

The results of a large study over a period of forty-four months were analyzed by the Committee on Administrative Practice of the American Public Health Association.¹¹ The study included 4,212 children between the ages of 8 months and 5 years. The injected and control groups were of relatively similar size with an equal distribution of age, sex, family size and geographic districts. There was found to be a striking similarity in the incidence of communicable childhood diseases other than pertussis in the two groups. The pertussis attack rate for the vaccinated group was 2.3 per cent and for the control group 15.1 per cent. The communicability rates for known exposures were 12.8 per cent and 68.5 per cent, respectively. When intimate household exposures alone were considered, the communicability rates were 34.9 per cent and 89.4 per cent. Further analysis¹² revealed a secondary familial attack rate of 36.4 per cent in the vaccinated group and of 92.0 per cent in the control group. Thus it would appear that vaccination resulted in about 60 per cent reduction in the risk of being attacked.

8. Sauer, L. W., Municipal Control of Whooping Cough, *J. A. M. A.* 109: 487-488 (Aug. 14) 1937.

9. Kendrick, P., and Eldering, G., The Significance of Bacteriological Methods in the Diagnosis and Control of Whooping Cough, *Am. J. Pub. Health* 25: 147-155 (Feb.) 1935.

10. Kendrick, P., Miller, J. J., and Lawson, G. M., Tentative Methods for the Bacteriological Diagnosis and Control of Whooping Cough, in Yearbook of the American Public Health Association, New York, 1935 1936, pp. 200-206.

11. Kendrick, P., and Eldering, G.: A Study in Active Immunization Against Pertussis, *Am. J. Hyg. (Sect. B)* 29: 133-153 (May) 1939.

12. Kendrick, P.: Secondary Familial Attack Rates from Pertussis in Vaccinated and Unvaccinated Children, *Am. J. Hyg. (Sect. A)* 32: 89-91 (Nov.) 1940.

4. Madsen, T.: The Bacteriology, Diagnosis, Prevention and Treatment of Whooping Cough, *Boston M. & S. J.* 102: 50-60 (Jan. 8) 1925; Vaccination Against Whooping Cough, *J. A. M. A.* 101: 187-188 (July 15) 1933.

5. Chievitz, I., and Meyer, A. H.: Recherches sur la coqueluche, *Ann. Inst. Pasteur* 30: 503-524, 1916.

6. Sauer, L. W.: Whooping Cough—A Study in Immunization, *J. A. M. A.* 100: 238-241 (Jan. 28) 1933; Immunization with Bacillus Pertussis Vaccine.

7. Bordet, J., and Gengou, O.: Le microbe de la coqueluche, *Ann. Inst. Pasteur* 20: 731-741, 1906.

The most thoroughgoing unfavorable report on pertussis immunization was that of Doull, Shibley, McClelland and others.¹³ The study was carried out in Cleveland in 1934 and 1935. Their vaccine was prepared from organisms grown for forty-eight hours on Bordet-Gengou medium containing human blood. The organisms were scraped from the medium, washed once with distilled water and resuspended in saline solution containing 0.5 per cent phenol to a concentration of 10 billion organisms per cubic centimeter. The children, who were between the ages of 6 and 15 months, were carefully selected and observed. There were 479 vaccinated children and 496 nonvaccinated children who were older siblings. The attack rates for the period from three months to 112 weeks after immunization were 15.8 per cent and 18.2 per cent, respectively. This indicates that the incidence of the disease in this study was only slightly less for the vaccinated than for the nonvaccinated group.

In a small study of intimate exposure in an orphanage during an epidemic in 1938 Kramer¹⁴ found that, while vaccination two years previously with Sauer's vaccine did not prevent the disease in the 9 test children, it had produced a partial immunity so that the cases were extremely mild. Twelve control children developed moderately severe cases. In the same group 8 children who had previously had whooping cough also developed mild cases. This would appear to indicate that vaccination had been as effective as a previous attack of the disease in conferring immunity. The figures indicate attack rates of 18 per cent and 24 per cent respectively for the vaccinated and nonvaccinated groups and a communicability rate of 100 per cent for both.

Siegel and Goldberger¹⁵ reported the results of an epidemic in a tuberculosis sanatorium. Sauer's vaccine had been given to 101 children whose average age was 2.8 years. A group of 82 control children whose average age was 2.7 years was selected. Attack rates were 8.9 per cent and 13.4 per cent, while communicability rates were 53 per cent and 58 per cent. The cases in the vaccinated group were somewhat milder and of shorter duration than those in the control group. These workers did not feel, therefore, that the vaccine was of notable value. Sauer,¹⁶ on the other hand, reported good results in an epidemic in an orphanage.

These first two studies were small but were controlled and indicated that, while the vaccine did not prevent the disease where there was prolonged intimate exposure as under the conditions in an institution, it did give protection from severe attacks, the resulting cases being mild and similar to those in children with positive histories of the disease.

A controlled study with the Sauer type vaccine was presented by Singer-Brooks.¹⁷ These studies were started in 1925 by Dr. J. J. Miller in the outpatient department of the University of California. Very severe criteria for exposure were held, and prob-

able or possible exposures were excluded. The vaccinated children were over 5 months of age, and sibling controls were used as far as possible. The follow-up study included educational measures and careful laboratory methods to establish bacteriologic diagnoses on primary cases and contacts. For a group of 330 vaccinated children and 200 sibling controls, communicability rates were reported as 7.8 per cent and 97.7 per cent, respectively. The figures indicate attack rates of 1.5 per cent and 22.0 per cent, respectively.

Silverthorne and Frazer¹⁸ reported 2 cases of whooping cough developing among 747 vaccinated children, of whom 91 were exposed. In a group of 161 control children of whom 27 were exposed, 23 cases developed. These figures would indicate communicability rates of 2.2 and 85.1 per cent for the vaccinated and nonvaccinated groups respectively. Vaccination was by means of a dosage of 120 billion organisms in Sauer type vaccine. The children were followed over a period of five years by public health nurses or private physicians.

Miller and Faber¹⁹ reported results on a small controlled series in the Well Baby Clinic of Stanford University, using Sauer type vaccine. Exact criteria of exposure and diagnosis were maintained. Of 346 vaccinated children 11 contracted the disease, indicating a communicability rate of 26.2 per cent. The communicability rate for a group of 182 control children was 88.9 per cent. Statistical analysis shows the difference between the two communicability rates to be significant.

Coppolino²⁰ reported favorable results with the Sauer type of vaccine on a small group of children in Philadelphia. Follow-up studies over a period of four and a half years indicated communicability rates for 152 vaccinated and 160 nonvaccinated children to be 7.1 per cent and 84.9 per cent, respectively. Only intimate exposures of two or more hours were recorded as exposure, and in most cases the exposure was for days or weeks.

Other reports, including those of Garvin,²¹ Mitchell,²² Rambar and his associates,²³ Perkins and his associates,²⁴ Daughtry-Denmark²⁵ and others present comparable results with the most widely used types of vaccine—those of Sauer and of Kendrick. Although these results continue to vary somewhat, the consensus is that solid immunity is conferred on some children and partial immunity on others, such as may occur following an attack of pertussis.

The two types of vaccine used in most of the preceding studies have several differences in their method of preparation. The Sauer type vaccine is an unwashed suspension of organisms, while the organisms used in the preparation of Kendrick's vaccine have been washed once with saline solution. Sauer²⁶ stated that the

13. Doull, J. A.; Shibley, G. S., and McClelland, J. E.: Active Immunization Against Whooping Cough: A Preliminary Report, *Am. J. Pub. Health* **26**: 1097-1105 (Nov.) 1936. Doull, J. A.; Shibley, G. S.; Haskin, G. E.; Bancroft, H.; McClelland, J. E., and Hoelscher, H.: Active Immunization Against Pertussis: Final Report on the Cleveland Immunization of 1934-1935, *Am. J. Dis. Child.* **58**: 691-698 (Oct.) 1939.
14. Kramer, J. G.: A Study of the Prophylactic Effects of Pertussis Vaccination, *J. Pediat.* **12**: 160-164 (Feb.) 1938.
15. Siegel, M., and Goldberger, E. W.: Active Immunization of Tuberculous Children Against Whooping Cough with Sauer's Vaccine, *J. A. M. A.* **109**: 1058-1062 (Oct. 2) 1937.
16. Sauer, L. W.: The Known and Unknown of *Bacillus Pertussis* Vaccine, *Am. J. Pub. Health* **25**: 1236-1230 (Nov.) 1935.
17. Singer-Brooks, C.: A Controlled Study of Pertussis Prophylaxis: A Comparison of Phase I H. Pertussis Vaccine with Undenatured Bacterial Antigen, *J. Pediat.* **14**: 25-38 (Jan.) 1939; *Pertussis Prophylaxis*.

18. Silverthorne, N., and Frazer, D. T.: Whooping Cough, *Canad. M. A. J.* **38**: 556-559 (June) 1938.

19. Miller, J. J., and Faber, H. K.: Immunization Against Pertussis, *J. A. M. A.* **112**: 1145-1148 (March 25) 1939. Miller, J.

20. Coppolino, J. F.: Pertussis Prophylaxis: A Clinical Study, *J. Pediat.* **21**: 348-352 (Sept.) 1942.

21. Garvin, J. A.: Efficacy of Sauer's Vaccine: Comparison of Incidence of Preschool Pertussis in a City with High and in One with Low Percentage of Immunization, *Ohio State M. J.* **36**: 738-739 (July) 1940.

22. Mitchell, J. A.: Pertussis Vaccine in the Prevention of Whooping Cough, *Am. J. Dis. Child.* **44**: 442 (April) 1940.

23. Rambar, R. L., and his associates: Pertussis Vaccine, *Am. J. Dis. Child.* **44**: 442 (April) 1940.

24. Perkins, J. A., and his associates: Pertussis Vaccine, *Am. J. Dis. Child.* **44**: 442 (April) 1940.

25. Daughtry-Denmark, L.: Whooping Cough Vaccine, *Am. J. Dis. Child.* **63**: 453-466 (March) 1942.

26. Sauer, L. W.: The Preparation of *Bacillus Pertussis* Vaccine for Immunization, *J. A. M. A.* **102**: 1471 (May 5) 1934.

supernatant fluid in an unwashed suspension contains an appreciable amount of soluble toxin and that subsequent washing of the original suspension would result in a decrease in the antigenic content of the vaccine. Miller²⁷ found that saline solution and distilled water washings of *H. pertussis* organisms contained a specific substance which would combine with the antibody in antipertussis rabbit serum to give flocculation. It was suggested that this might partly explain the differences in the findings of those using washed and unwashed vaccines. However, Kendrick and Eldering⁹ found that washing the organisms even three times with saline solution did not decrease the typical skin reaction or the ability to produce agglutinins in the rabbit and therefore washed their organisms once with saline solution before making the final suspension. The vaccine of Doull, Shibley and McClelland,¹³ on the other hand, which gave such unfavorable results, was of organisms washed once with distilled water. Miller suggests that perhaps distilled water may denature the surface antigen of *H. pertussis*, while saline solution simply removes a part of it.

Another difference between the vaccines used at present is in the type of blood used in the medium on which the organisms are grown. Sauer vaccine²⁸ is prepared from organisms grown on Bordet-Gengou medium that contains human blood, both for the prevention of sensitization of individuals to animal serum and for the maintenance of the organisms in phase I. The growth at forty-eight hours is scraped into saline solution rather than washed from the medium in order to avoid carrying over any extraneous material. Kendrick and Eldering⁹ on the other hand, used either human or sheep blood and found that both maintained the organisms in phase I. They point out that sheep blood is more uniformly constant and less limited in supply than human blood and have used it in the commercial preparation of their vaccine.

A number of workers have felt that the inclusion of toxic substance in *H. pertussis* vaccine would result in increased potency. In 1930 Mishulow, Mowry and Scott²⁹ prepared a "toxin-vaccine" by growing the organisms on solid medium with a small amount of horse serum-beef heart broth added to encourage elaboration of toxic material. Each lot of vaccine was tested for the presence of toxic substance by the Shwartzman method. This vaccine was found to elicit agglutinins in rabbits to a greater extent than Sauer's vaccine, which was used for comparison. Later Mishulow³ reported results from a small clinical study, using material prepared by a modification of the original method. Agglutination studies showed that a greater response was obtained by the use of the toxin-vaccine than by Sauer vaccine. Shorr,³⁰ Park³¹ and Lapin, Cohen and Weichsel³² reported favorable results of protection in several small studies. It was noted that the local and general reactions to this type of vaccine were greater than with other types. This type of vaccine is distributed by the New York City Department of Health and has been in general use since 1930.

It will be noted that the total dosage of organisms administered in the vaccines in present use ranges from 80 to 120 billion organisms. Madsen⁴ had obtained comparatively favorable results by increasing the dosage to 22 billion from between 50 million and 3.5 billion, as used by the majority of workers at that time. Sauer,³³ feeling that an adequate number of organisms is an important factor, then increased the dosage to 70 to 80 billion. Many feel that 80 billion organisms is sufficient, but Daughtry-Denmark³⁴ and others advocate larger doses to be given to older children and in cases in which complement fixation is not complete after the regular course. Sauer prepared a double strength vaccine of 20 billion organisms per cubic centimeter. This, however, has been largely discontinued, because of the numerous local reactions occurring,³⁵ and now the "intermediate strength" vaccine of 15 billion organisms per cubic centimeter is that in common use.

Recently a number of investigators have attempted to prolong protection through the use of a stimulating dose of vaccine given at intervals after the initial course of immunization, as in the case of immunizations against diphtheria, tetanus, typhoid and other diseases. Wu and Chu³⁶ in 1938 found that a single stimulating dose of 15 billion organisms resulted in a large increase in agglutinative titer above that following the initial vaccination. Lapin³⁷ found close correlation between agglutinative titer, mouse protection and complement fixation in a small study of reinoculated children following exposure to sibling contacts. No cases of the disease developed. Miller,³⁸ Shaw³⁹ and others recommended yearly reinoculation. McLean⁴⁰ suggested a stimulating dose to be given on exposure and on entrance to school. It is now felt that the duration of immunity may perhaps depend in part on subclinical infection following exposures at a time when resistance is high, serving as a stimulus in increasing resistance. Thus the lower incidence of the disease among older children following exposures might be explained.

During the last few years several studies have been made to determine whether alum precipitation of pertussis vaccine might increase its antigenic efficiency as in the case of diphtheria toxoid. Harrison, Franklin and Bell⁴¹ made a small study with a single dose of such a vaccine and obtained a lower incidence among vaccinated children than among controls, although the difference was not statistically significant. Considering the small dosage used, these preliminary results seemed to justify further study. Bell⁴² later conducted a study on the use of two doses of alum precipitated vaccine with a four week interval. The total dosage was 20 billion organisms. This study was very carefully arranged epidemiologically so that the vaccinated and

33. Sauer, L. W.: Immunization with *Bacillus Pertussis* Vaccine, *J. A. M. A.* **101**: 1449-1451 (Nov. 4) 1933.

34. Daughtry-Denmark, L.: Studies in Whooping Cough: Diagnosis and Immunization, *Am. J. Dis. Child.* **52**: 587-598 (Sept.) 1936.

35. Sauer, L. W., and Tucker, W. H.: Simultaneous Administration of Diphtheria Toxoid and Pertussis Vaccine in Young Children, *Am. J. Pub. Health* **32**: 385-388 (April) 1942.

36. Wu, J. P., and Chu, F. T.: Effect of a Stimulation Dose of Pertussis Vaccine in Children Previously Immunized, *Proc. Soc. Exper. Biol. & Med.* **38**: 693 (June) 1938.

37. Lapin, J. H.: The Stimulation Dose in Whooping Cough, *J. Pediat.* **20**: 18-25 (Jan.) 1942.

38. Miller, J. J.: The Present Status of Immunization Against Pertussis, *California & West. Med.* **53**: 25-38 (July) 1940.

39. Shaw, E. B., in Round Table Discussion of Prevention of Contagious Diseases, *J. Pediat.* **17**: 405-418 (Sept.) 1940.

40. McLean, I. H.: Prophylactic Inoculation Against Whooping Cough, *Proc. Roy. Soc. Med.* **33**: 425-432 (May) 1940.

41. Harrison, W. T.; Franklin, J. P., and Bell, J. A.: Prophylactic Value of a Single Dose of Precipitated Pertussis Vaccine, *Pub. Health Rep.* **53**: 793-796 (May 20) 1938.

42. Bell, J. A.: Pertussis Prophylaxis with Two Doses of Alum Precipitated Vaccine, *Pub. Health Rep.* **56**: 1535-1546 (Aug. 1) 1941.

27. Miller, J. J.: The Loss of Specific Substance in Washing Phase I *H. Pertussis* Vaccines, *Proc. Soc. Exper. Biol. & Med.* **37**: 45-49 (Oct.) 1938.

28. Sauer, footnotes 6 and 26.

29. Mishulow, L.; Mowry, I. W., and Scott, E. B.: Pertussis Toxin Filtrates and Toxin-Vaccines, *J. Immunol.* **19**: 227-235 (Aug.) 1930.

30. Shorr, E. Y.: Prophylactic Pertussis Immunization, *J. Pediat.* **9**: 49-55 (July) 1936.

31. Park, W. H., in Round Table Discussion on Whooping Cough, *J. Pediat.* **7**: 690-699 (Nov.) 1935; in Report of Proceedings of the Second International Congress on Microbiology, 1937, sect. 8, p. 487.

32. Lapin, J. H.; Cohen, P., and Weichsel, M.: Prophylactic Vaccination Against Whooping Cough, *Arch. Pediat.* **56**: 590-598 (Sept.) 1939.

nonvaccinated groups were identical in all respects without selection, uniformly observed over an adequate period of time and with the definition of clinical pertussis strictly adhered to. Under such well controlled conditions the attack rates were considered significant. For older children the attack rates for vaccinated and nonvaccinated groups were 11.2 per cent and 39.1 per cent, respectively, and for younger children these rates were 9.4 and 29.7 per cent. It was therefore concluded that real protection had been conferred by this vaccine.

Kendrick⁴³ compared her standard vaccine of 70 billion organisms, given over a period of three weeks, with an alum precipitated vaccine, using a total dosage of 30 billion organisms over a five week period in three injections. There was a one week interval between the first and second and a four week interval between the second and third injections. No significant difference was found between the attack rates of the two vaccinated groups. Daughtry-Denmark,²⁵ in a comprehensive study of seven different types of vaccine, found alum precipitated vaccine to be as effective as standard vaccine of the same strength when judged by complement fixation reactions.

The combination of pertussis vaccine with diphtheria and/or tetanus toxoid has been suggested by a number of workers. This would be a convenient means of reducing the number of routine immunization injections generally recommended for infants and children. Bordet⁴⁴ reported the use of mixed *H. pertussis* vaccine and diphtheria toxoid given in three injections at three week intervals. Schütze⁴⁵ and Mathieson⁴⁶ found that, in guinea pigs, alum precipitated pertussis vaccine and diphtheria toxoid inoculated simultaneously were compatible and that the immune response to the toxoid was enhanced, while the response to pertussis vaccine was the same as the response to vaccine alone. Sauer and Tucker³⁵ obtained development of complement fixing antibodies in response to mixed *H. pertussis* vaccine and diphtheria toxoid in three doses at three week intervals equal to that obtained with *H. pertussis* vaccine alone. Daughtry-Denmark²⁵ obtained like results with three doses at one week intervals. Kendrick⁴³ has reported satisfactory response in a small study in which pertussis vaccine alone was injected first, followed in one week by a dose of alum precipitated combined diphtheria toxoid and pertussis vaccine. Lapin,⁴⁷ Daughtry-Denmark²⁵ and Miller and Saito⁴⁸ have reported encouraging results with the combinations of pertussis vaccine, diphtheria toxoid and tetanus toxoid.

Recent investigations in the field of immunochemistry have shown that *H. pertussis* has several distinct antigenic components. A "toxic substance" was described by Bordet and Gengou⁴⁹ in 1909, but it was not until twenty years later that a toxic factor was shown to be

antigenic. Teissier and his associates⁵⁰ and Lawson⁵¹ demonstrated the production of neutralizing antibodies in animals by the use of a toxic filtrate of cell extracts. In 1937 Evans and Maitland⁵² described a thermolabile toxin and were able to produce neutralizing antibodies in animals. Antitoxin production in human beings, however, was not reported until 1940, when Evans⁵³ was able to show that careful injection of the toxin over a long period of time could produce a low antitoxic titer. Florsdorf and Kimball⁵⁴ later demonstrated the thermolabile toxin of Evans and Maitland and described a second less antigenic thermostable toxin. Strean and Grant⁵⁵ prepared what they consider to be pertussis endotoxin by repeatedly freezing and thawing the organisms. The purified preparation was found to contain no agglutinin. They were able to produce an antitoxin in rabbits by inoculation of this material or a toxoid prepared by formaldehyde treatment.

The role of the pertussis toxin in the clinical disease continues to be unknown; but some workers have felt that, if antitoxic as well as antibacterial immunity could be produced by immunization, the individual might have better protection against whooping cough.

Roberts and Ospeck⁵⁶ have prepared a toxic filtrate from broth cultures of strains, not necessarily in phase I, shown to have strong toxic properties. This filtrate is detoxified by solution of formaldehyde and is known commercially as "detoxified pertussis antigen." This preparation has been used in both prophylaxis and treatment. Weichsel and his associates⁵⁷ published a report on a clinical study on immunization in a small group of children. Significant antitoxic titers could be produced if adequate dosage was given. The extent of the immunity produced has been measured by laboratory methods, but clinical data on this study are not yet available. Bullowa and Alterman⁵⁸ and Joslin and Christensen⁵⁹ have described the use of detoxified pertussis antigen as a prophylactic agent, but the studies have not progressed far enough for the results to be properly evaluated. Strean⁶⁰ reports that investigation into the value of combined pertussis bacterial vaccine and pertussis toxoid for prophylaxis is under way.

Several other preparations for immunization to pertussis have been developed and given clinical trials in recent years. These include "Udenatured Bacterial Antigen" and "Topagen." The Udenatured Bacterial

43. Kendrick, Pearl L.: Use of Alum Treated Pertussis Vaccine and of Alum Precipitated Combined Pertussis Vaccine and Diphtheria Toxoid, for Immunization, *Am. J. Pub. Health* **32**: 615-626 (June) 1942.

44. Bordet, J.: A propos du vaccin antioquelucheux, *Bruxelles-méd.* **16**: 503-505 (Feb. 2) 1936.

45. Schütze, H.: Simultaneous Immunization Against Whooping Cough and Diphtheria, *Lancet* **2**: 192-193 (Aug. 17) 1940.

46. Mathieson, D. R.: A Laboratory Evaluation of a Combined Antigen for Diphtheria and Whooping Cough Prophylaxis, abstracted, *J. Bact.* **43**: 81 (Feb.) 1942.

47. Lapin, J. H.: Combined Immunization of Infants Against Diphtheria, Tetanus and Whooping Cough, *Am. J. Dis. Child.* **63**: 225-237 (Feb.) 1942.

48. Miller, J. J., and Saito, T. M.: Concurrent Immunization Against Tetanus, Diphtheria and Pertussis, *J. Pediat.* **21**: 31-44 (July) 1942.

49. Bordet, J., and Gengou, O.: L'endotoxine coquelucheuse, *Ann. Inst. Pasteur* **23**: 415-419, 1909.

50. Teissier, P.; Reilly, J.; Rivalier, E., and Cambessédès, H.: Nouvelles recherches sur l'immunité et la sérothérapie anti-endotoxiques: Le sérum antioquelucheux, *J. de physiol. et de path. gén.* **27**: 549-564 (Sept.) 1929.

51. Lawson, G. M.: The Epidemiology of Whooping Cough, *Am. J. Dis. Child.* **46**: 1454 (Dec.) 1933.

52. Evans, D. G., and Maitland, H. B.: The Preparation of the Toxin of *H. Pertussis*: Its Properties and Relation to Immunity, *J. Path. & Bact.* **45**: 715-731 (May) 1937.

53. Evans, D. G.: The Production of Pertussis Antitoxin in Rabbits and the Neutralization of Pertussis, Parapertussis and Bronchiolitis Toxins, *J. Path. & Bact.* **51**: 49-58 (July) 1940.

54. Florsdorf, E. W., and Kimball, A. C.: Separation of the Phase I Agglutinin of *H. Pertussis* from Toxic Components, *J. Immunol.* **39**: 475-493 (Dec.) 1940.

55. Strean, L. P., and Grant, G.: The Preparation and Properties of Haemophilus Pertussis Endotoxin, *Canad. M. A. J.* **43**: 528-531 (Dec.) 1940.

56. Roberts, M. E., and Ospeck, A. G.: Pertussis Toxin, *J. Infect. Dis.* **71**: 264-269 (Nov.-Dec.) 1942.

57. Weichsel, M.; Katona, N., and Liu, F.: Pertussis Antitoxin, *Am. J. Dis. Child.* **64**: 1-10 (July) 1942.

58. Bullowa, J. G. M., and Alterman, J.: Pertussis Immunity with Toxin and Antitoxin, *J. A. M. A.* **120**: 886-890 (Nov. 21) 1942.

59. Joslin, C. L., and Christensen, T. A.: Prophylaxis and Treatment of Whooping Cough with a Pertussis Antigen, *Am. J. Dis. Child.* **60**: 1269-1276 (Dec.) 1940.

60. Strean, L. P.: Immunological Studies on Pertussis Toxin Prepared Free of Agglutinin, abstracted, *J. Bact.* **43**: 80 (Jan.) 1942.

Antigen, known as "U. B. A.," was prepared by Krueger and his co-workers⁶¹ by washing the organisms three times in Locke's solution, grinding them in a ball mill and retaining the filtrate. Dow,⁶² Miller,⁶³ Lawson⁶⁴ and Flosdorf, Kimball and Chambers⁶⁵ have given varying reports on the antigenicity of this substance. Singer-Brooks,⁶⁶ in a small clinical study, found communicability rates for vaccinated and control groups very similar. It has been suggested that a loss of immune principle may in part be due to the fact that the preparation is carried out at room temperature, at which part of the toxin would be destroyed during the procedure. "Topagen" is a soluble antigen which is administered by the intranasal route. It is prepared by macerating the organisms in saline solution, centrifuging, precipitating the soluble antigen by acetone and redissolving in saline solution. Slesinger,⁶⁷ Barksdale⁶⁸ and Gold⁶⁹ reported good results in the treatment of contacts. However, Dow⁶² in animal experiments found Topagen considerably less effective than other vaccines. No large study on prophylaxis with this substance has appeared. It has been suggested for treatment of contact cases.

COMMENT

The data presented here have been assembled from a number of different investigators who have carried out independent studies under a variety of test conditions. Clinical whooping cough is notoriously unpredictable in the severity of individual attack and epidemic course. However, the majority of the studies have indicated that the incidence of whooping cough can be lowered by the administration of either the Sauer or the Kendrick type of pertussis vaccine in adequate dosage, after six months of age. These new vaccines appear to lower the attack rate in vaccinated individuals and to decrease the severity of the disease.

Although extensive laboratory studies have been carried out in an effort to determine the degree of immunity conferred by pertussis vaccines, the relationship between serologic findings and actual protection of the individual is not clear. There has been in the past no simple index of immunity, such as a reliable skin test. Within the last few years new skin testing technics have been reported,⁷⁰ with promising preliminary results. If the results of these methods continue to be satisfactory the control of whooping cough will be greatly simplified.

At present the incidence and severity of the disease as the result of actual exposure under adequately controlled field conditions are the only means of proving the efficiency of whooping cough vaccines. Improved culture methods⁷¹ have given more accurate bacteriologic diagnoses and have aided somewhat in differentiating whooping cough caused by *H. pertussis* from a similar but milder paroxysmal disease caused by *Bacillus parapertussis*.⁷² Wider use of these methods is advocated for the more adequate control of whooping cough.

The role of pertussis toxin in the disease has not been established. A lack of correlation has been found between the production of antitoxic antibodies and the severity of an attack. The antitoxin is demonstrable for only a short time after the disease and is not found in normal serums. Experimental evidence, on the other hand, has shown agglutinins to phase I organisms over a long period of time after either an attack of the disease or vaccination against it.⁷³ It would seem, therefore, that whole bacterial vaccines would produce the proper protective antibodies.

A report of the Committee on Therapeutic Procedures for Acute Infectious Diseases and on Biologicals of the American Academy of Pediatrics⁷⁴ recommends immunization against pertussis as a routine procedure with the following specifications: 1. Pertussis Vaccine Immunizing (Sauer) 6 cc. of vaccine standardized to 15 billion organisms per cubic centimeter, three injections at three week intervals, or (on the West Coast) 2.5 cc. of vaccine standardized to 40 billion organisms per cubic centimeter, three injections at two to four week intervals. Pertussis Vaccine Immunizing (Kendrick and Eldering) 7 cc. of vaccine standardized to 10 billion organisms per cubic centimeter, four injections. The committee recommends the use of phase I vaccine. 2. Pertussis detoxified antigen, 1.5 to 2.0 cc. subcutaneously for three to five doses every two to three days. 3. Alum precipitated pertussis vaccine (Harrison-Bell) 0.2, 0.3 and 0.5 cc. every four to eight weeks, standardized at 40 billion killed pertussis organisms per cubic centimeter.

Vaccines for the prophylaxis of whooping cough were eliminated from New and Nonofficial Remedies in 1931 because of the fact that convincing evidence of their value was not presented during the years in which they were in extensive use. There was no general agreement on the method of preparation and administration, and clinical reports from physicians varied widely. However, the evidence presented in this report from studies during the period since 1931, with more recent preparations, demonstrate that whole bacterial vaccines prepared from virulent phase I *H. pertussis* given in proper dosage after 6 months of age do confer significant protection as measured by reduction in the attack rate and severity of pertussis.

61. Krueger, A. P.; Nichols, V. C., and Frawley, J. M.: The Preparation of Active Undenatured Antigen from *Haemophilus Pertussis*, *Proc. Soc. Exper. Biol. & Med.* **30**: 1097-1099 (May) 1933.

62. Dow, R. P.: Active Immunization by the Intranasal Route: A Comparison of Various *H. Pertussis* Antigens, *Canad. Pub. Health J.* **31**: 370-375 (Aug.) 1940.

63. Miller, J. J.: Experimental Observations on the Antigenic Potency of *H. Pertussis* Extracts, *J. Immunol.* **26**: 247-265 (April) 1934.

64. Lawson, G. M.: Immunity Studies in Pertussis, *Am. J. Hyg.* **29**: 119-131 (May) 1939.

65. Flosdorf, E. W.; Kimball, A. C., and Chambers, L. A.: Studies on *H. Pertussis*: I. Liberation by Sonic Vibration of a Soluble Component That Absorbs Phase I Agglutinins, *Proc. Soc. Exper. Biol. & Med.* **41**: 123-126 (May) 1939.

66. Singer-Brooks, C.: Pertussis Prophylaxis: A Controlled Study, *J. A. M. A.* **114**: 1734-1740 (May) 1940.

67. Slesinger, H. A.: The Treatment of Pertussis with Intranasal Antigen: A Preliminary Report, *J. Pediat.* **9**: 42-48 (July) 1936.

68. Barksdale, I. S.: Further Studies on a Simplified Cough Plate Method for the Early Diagnosis of Whooping Cough; Evaluation of Installation of Topagen Intranasally in Prevention and Clinical Arrest of the Disease, *South. Med. & Surg.* **103**: 176-180 (April) 1941.

69. Gold, H.: The Treatment of Pertussis with Specific Soluble Antigen, *J. Pediat.* **10**: 641-647 (May) 1937.

70. Flosdorf, E. W.; Felton, H. M.; Bondi, A., and McGuinness, A. C.: Intradermal Test for Susceptibility to and Immunization Against Whooping Cough Using Agglutininogen from Phase I, *H. Pertussis*, *Am. J. M. Sc.* **206**: 421-425 (Oct.) 1943.

71. Strean, L. P.: A Skin Test for Susceptibility to Pertussis, *Canad. M. A. J.* **42**: 525-528 (June) 1940.

72. Strean, L. P.; Lapoint, D., and Dechene, E.: Clinical Studies in Immunity to Pertussis with Use of Pertussis Skin Testing Toxin and Antiendotoxin, *ibid.* **45**: 326-332 (Oct.) 1941.

73. Smolens, J., and Mudd, S.: Agglutininogen of *Haemophilus Pertussis*, Phase I, for Skin Testing: Theoretical Considerations, and a Simple Method of Preparation, *J. Immunol.* **47**: 155-163 (Aug.) 1943.

74. Felton and Flosdorf.

71. Saito, T. M.; Miller, J. J., and Leach, C. W.: Nasopharyngeal Swab in the Diagnosis of Pertussis, *Am. J. Pub. Health* **32**: 471-474 (May) 1942.

72. Miller, J. J.; Leach, C. W.; Saito, T. M., and Humber, J. B.: Comparison of Nasopharyngeal Swab and Cough Plate in Diagnosis of Whooping Cough and *Haemophilus Pertussis* Carriers, *ibid.* **33**: 839-843 (July) 1943.

73. Kendrick, Miller and Lawson.

74. Eldering, G., and Kendrick, P.: *Bacillus Parapertussis*: Species Resembling Both *Bacillus Pertussis* and *Bacillus Bronchisepticus* But Identical with Neither, *J. Bact.* **35**: 561-572 (June) 1938.

Miller, J. J.; Saito, T. M., and Silverberg, R. J.: *Parapertussis*: Clinical and Serological Observations, *J. Pediat.* **15**: 229-240 (Aug.) 1941.

73. Felton, H. M., and Flosdorf, E. W.: Clinical Results with the Use of Agglutininogen from Phase I *Haemophilus Pertussis* as a Skin Test for Susceptibility to Whooping Cough, *J. Pediat.* **22**: 259-264 (March) 1943.

Miller, J. J.; Silverberg, R. J.; Saito, T. M., and Humber, J. B.: An Agglutinin Reaction for *Haemophilus Pertussis*, *J. Pediat.* **22**: 637-643 (June) 1943.

74. Report of the Committee on Therapeutic Procedures for Acute Infectious Diseases and on Biologicals, presented at the meeting of the American Academy of Pediatrics, October 1943.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - CHICAGO 10, ILL.

Cable Address - - - "Medic, Chicago"

Subscription price - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, SEPTEMBER 30, 1944

THE MALE CLIMACTERIC

Some fifteen years have elapsed since the first report on the use of standardized estrogenic substance as treatment of women in the climacteric syndrome. Skepticism about the nature of the menopause and the value of its endocrine therapy has been allayed and the indications for use have been more clearly defined. Those clinicians who believed that the symptoms of the climacteric were wholly psychogenic in etiology and to be treated by sedation or psychotherapy are now convinced of the dependability and efficacy of a variety of estrogenic materials, natural and synthetic. Conviction has been aided by widespread clinical success. Objective proof has included the demonstrations of the effect on the vaginal epithelium and the mammary tissues of the two ovarian hormones both estrogenic and progestational in type. Apparently only the estrogens are involved in the prevention or relief of the autonomic and psychic symptoms which are usually spoken of as the menopause syndrome. A further important observation has been the demonstration of an increase in the urinary excretion of gonadotropic material following castration or the occurrence of the spontaneous menopause. This phenomenon is apparently uniformly observed unless the pituitary is in some way destroyed or removed. The phenomenon has therefore been interpreted as meaning an excessive secretion of pituitary gonadotropic hormone following the elimination or atrophy of the ovaries. There is still room for debate as to whether this is excessive secretion by the pituitary or the excretion by the kidneys of unused anterior lobe gonadotropic hormone.

More recently extensive debate among clinicians has concerned the validity of the concept of the male climacteric syndrome. Castration of male adults is apt to be followed by a group of symptoms essentially identical with those noted in women after removal of the ovaries or spontaneous menopause. Men who do not suffer surgical extirpation of the testicles may never experience such symptoms. Not infrequently, however, complaints of a similar character are made by men in

any age from the third decade on. Whether this is to be attributed to testicular atrophy or failure of testicular secretion is the point in question. Many cases of such disorders have been treated with synthetic testosterone propionate or methyltestosterone, the latter being demonstrably active when administered orally. Satisfactory clinical improvement has been reported by several clinicians. Such success might possibly be attributed to the general stimulation of secondary sex characters by these substances or even to the increase in muscle tissue as well as in physical vigor produced thereby. However, the recent work of Heller and his associates from the Wayne University Medical School shows that there is an increase in the anterior pituitary gonadotropic hormone in the urine of men who have been castrated, of men whose testicles have atrophied and of a group of patients who fit the concept of a male climacteric. This is analogous to the situation in the female. Therapy with androgenic materials has given distinct relief to these patients, fitting likewise the probability of the existence of the climacteric. Another group of individuals with somewhat similar complaints had rather indifferent benefits from the use of the androgen; they were shown also to be different in that there was no significant increase of the pituitary gonadotropic hormone in the urine samples investigated.

The facts that are here cited serve to indicate with increasing probability that the male climacteric is just as truly a syndrome based on endocrine disturbances as is the menopause syndrome in women. Unfortunately objective means for making these differentiations are still limited to investigative clinics and hospitals.

PHYSIOLOGIC ACTION OF IN VIVO ANTICOAGULANTS

Such substances as heparin and dicumarol and to a lesser degree salicylates are known to have definite anticoagulant properties *in vivo*. The mechanism of this action, as yet not clearly defined, has been partially clarified by the work of numerous investigators; this information has been recently summarized by Quick.¹ In the case of heparin the strongly acid property of the structure assigned to it (mucotin-sulfuric acid-like) by Charles and Todd is considered to be significant. By virtue of this property it is able to form stable salts with many proteins, particularly those with basic reaction. The union of heparin and an as yet unidentified protein co-factor of the albumin fraction of the blood is advanced by Quick to explain the antithrombic activity of heparin. The complex so formed has the power to bind thrombin, thus preventing this substance from assuming its essential role in the coagulation of blood. The participation of this co-factor appears to be necessary, since heparin by itself is not an anticoagu-

1. Quick, A. J.: The Anticoagulants Effective *In Vivo* with Special Reference to Heparin and Dicumarol, *Physiol. Rev.* 24: 277 (July) 1944.

lant. This reaction is reversible when a strongly basic protein like protamine is added to the blood. The antithrombic activity is lost when the heparin breaks its combination with the albumin factor in favor of the more strongly basic protamine, thus releasing the thrombin. Brinkhous and his associates² describe another *in vivo* action of heparin. This involves the blocking of the conversion of prothrombin to thrombin. Here again an unidentified plasma factor appears to be necessary. At present it is not clear whether this represents an interference at the thromboplastic or prothrombic level. Ferguson and Glazko³ reason that the effect occurs at both points. If this was so the presence of heparin would offer a block to coagulation at several stages.

The effect of heparin on blood platelets is important, since the starting point of a thrombus is a small mass of agglutinated platelets. There does not appear to be a direct action of heparin on the platelets, but clumping of these cells is prevented as a result of the anticoagulant property. Baronofsky and Quick⁴ did not find clumping or reduction in the number of platelets in blood to which 0.25 mg. of heparin per cubic centimeter had been added, while Best and his co-workers did not prevent agglutination of platelets in dog blood with the clotting time raised to six hours by heparin. Greater doses were effective in preventing the clumping, however. In general a lack of uniformity in degree of response to heparin has been evident. Possible explanations lie in the variability of the compound itself as obtained from different sources and aberrations in the plasma protein of the subjects studied.

From studies on the hemorrhagic disease in cattle resulting from ingestion of spoiled sweet clover hay has come the isolation by Link and his associates⁵ of the active principle, dicumarol. Its chemical structure has been determined and mode of action postulated. The anticoagulant effect is attributed to a depression of synthesis of prothrombin rather than a direct effect on this substance. Quick has demonstrated that prothrombin consists of two components. One of these is known to be diminished in dicumarol poisoning. The mechanism of this reduction is not clear, but it has been suggested that there results an inability of the liver to utilize vitamin K for the production of this prothrombin component, possibly because of a toxic effect on the enzyme system producing prothrombin. The fall in prothrombin after administration of dicumarol takes place rather slowly, reaching its lowest point in about forty-eight to ninety-six hours and returning to

normal in a week. Bollman and Preston⁶ found a fall of about 15 per cent after three days when a dosage of 10 mg. per kilogram was administered to dogs. According to Quick a critical minimum dose appears necessary, and greatly increased amounts will not hasten the fall in prothrombin. The return of the prothrombin level to normal may be speeded by administration of natural vitamin K₁ oxide. Using this material, Davidson and MacDonald⁷ reported a reversal of dicumarol effect in 4 out of 5 cases by the use of large doses. There is thought to be either a neutralization of the toxin or a synthesis of prothrombin in the presence of excess vitamin K. Synthetic vitamin K counteracts the dicumarol hypoprothrombinemia in most cases when large doses are used. The transfusion of either fresh or citrated banked blood has not been consistently effective in restoring the prothrombin. Thus there is not available at present any thoroughly dependable agent to combat the hypothrombinemia induced by dicumarol.

The antiprothrombic activity of dicumarol in the liver appears to be its sole effect on this organ. The livers of animals subjected to repeated injections of this material have been found entirely normal at necropsy by several investigators. Liver function tests likewise show no impairment. When dicumarol is used in the presence of existing hepatic damage or when fever exists, a heightened response is reported. There is conflicting evidence of the effect on capillary fragility and sedimentation rate. Wright and Prandone state that increase in capillary fragility was not detected in the patients receiving dicumarol under their observation. However, dicumarol has been noted to cause vascular dilatation and purpura after massive doses. As found with the use of heparin, when the blood coagulation time is greatly delayed by administration of dicumarol, platelet clumping no longer occurs.

More recently Link and his associates and independently Rapoport and his co-workers have made the observation that salicylates administered either orally or intravenously cause hypoprothrombinemia which can be prevented or counteracted by administration of synthetic vitamin K. Several workers who have studied this effect of the salicylates believe that the action is essentially that of dicumarol but less powerful. One of these substances may actually complement the activity of the other. Salicylates show an effect in cirrhosis similar to the increased response found with dicumarol. The potentialities of these actions are great whether or not the agents are used therapeutically under adequate control or exert their effect as an undesirable side reaction. More information on methods of controlling the effects of these anticoagulants and on their potential toxicity is urgently needed.

2. Brinkhous, K. M.; Smith, H. P.; Warner, E. D., and Seegers, W. N.: The Inhibition of Blood Clotting, *Am. J. Physiol.* **125**: 683 (April) 1939.

3. Ferguson, J. H., and Glazko, A. J.: Heparin and Natural Antiprothrombin in Relation to Activation and "Assay" of Prothrombin, *Am. J. Physiol.* **134**: 47 (Aug.) 1941.

4. Baronofsky, I. D., and Quick, A. J.: Heparin and the Agglutination of Platelets in Vitro, *Proc. Soc. Exper. Biol. & Med.* **53**: 173 (June) 1943.

5. Campbell, H. A.; Roberts, W. L.; Smith, W. K., and Link, K. P.: Studies on the Hemorrhagic Sweet Clover Disease, *J. Biol. Chem.* **136**: 47 (Oct.) 1940.

6. Bollman, J. L., and Preston, F. W.: The Effect of Experimental Administration of Dicoumarin, *J. A. M. A.* **120**: 1021 (Nov. 28) 1943.

7. Davidson, C. S., and MacDonald, Harriet: A Critical Study of the Action of 3,3'-Methylene-Bis-(4-Hydroxycoumarin) (Dicoumarin), *Am. J. M. Sc.* **205**: 24 (Jan.) 1943.

CORONARY HYPERSUSCEPTIBILITY

Klinge¹ and Vaubel² of pre-Nazi Germany showed fifteen years ago that in rabbits parenteral administration of large doses of horse serum is often followed by vascular and perivascular alterations in the smaller branches of the coronary arteries, other parts of the vascular system being unaffected. They described the coronary lesions as closely resembling those of "human rheumatism." Interest attaches to these observations, owing to the increasing use of large doses of antiserum in clinical medicine and to the contemplated use of heterologous plasma or plasma fractions in human transfusion. The experiments were therefore repeated by Rich and Gregory³ of Johns Hopkins University and later studied in greater detail by Fox and Jones⁴ of St. Louis University.

The St. Louis investigators made careful microscopic studies of 31 adult albino rabbits previously given one or more intraperitoneal or subcutaneous injections with large doses (10 cc. per kilogram) of horse serum followed by one or more 1 cc. doses given intravenously. The rabbits were killed at arbitrary intervals after the last injection. The investigators found severe coronary lesions in 20 of the 31 injected rabbits, with 7 rabbits showing milder coronary alterations. All noninjected controls were negative.

The vascular changes noted in the injected animals were characterized by intimal hyperplasia and proliferation of adventitial cells, the latter being frequently interspersed with lymphocytes and mononuclear cells or surrounded by them, with an occasional polymorphonuclear neutrophil. Fibroid degeneration was occasionally noted in the intima and media, but without definite necrosis. The coronary lesions closely resembled those often described under such terms as "rheumatoid arteritis" or "rheumatic carditis."³ The vascular changes were usually limited exclusively to the coronary arterioles, though mild vascular lesions were occasionally found in the liver, lungs, testes, kidneys or mesentery.

Fox did not find any significant relationship between the severity of the coronary lesions and the number of doses, time interval or sequence of large and small doses of horse serum. Some rabbits exhibited severe vascular changes following a single large dose of serum. There was, however, a suggested correlation between the severity of the coronary lesions and the degree of acquired cutaneous sensitivity to horse proteins. All animals with the necrotic type of reaction to routine skin tests exhibited material degenerative changes in the coronary arterioles. Equally manifest changes, how-

ever, were occasionally noted in rabbits with non-necrotic skin sensitivity. Twelve of the 31 rabbits developed Fleisher's⁵ "serum sickness reaction" of the ears, following a large parenteral dose of horse serum. This "scarlatinal reaction" was invariably associated with appreciable degenerative changes in the coronary arterioles.

Aside from its bearing on current problems of serum therapy and plasma transfusion, this latest confirmation of the Klinge-Vaubel phenomenon is of basic clinical interest. It is experimental proof that the coronary arterioles are more highly susceptible to mild toxic injury than other parts of the vascular system.

RENAL DAMAGE FROM SULFONAMIDE COMPOUNDS

Shortly after the sulfonamide compounds came into general use, physicians recognized that the kidney may be damaged in the course of therapy with these drugs. Two types of renal complications were observed: (1) those due to mechanical obstruction of the pelvis, the ureters and the renal tubules by crystals of the sulfonamide compounds and (2) those due to toxic lesions of the kidney without obstruction. Combination of the two forms has likewise been described. In addition to tubular necrosis, which is the usual expression of damage by toxic substances, instances were observed in which interstitial tissue reaction with necrosis was also present. Murphy and his associates¹ observed 1 such instance in the series reported by them. They feel that this type of reaction is probably an expression of severe idiosyncrasy on the part of the renal tissue to the drug. This inflammatory response was also seen in tissues outside of the kidney represented by giant cells and perivascular granuloma-like cell accumulations suggesting a similarity with periarteritis nodosa and similar lesions. The hepatic damage observed in these cases is probably related to the nephrotoxic complications.

Study of the clinical data of 14 patients with renal insufficiency following use of sulfonamide compounds in relation to postmortem observations on 13 revealed that the quantity of the sulfonamide compound administered and the drug level in the blood appeared to be unimportant in producing the renal damage. As much as 41 grams and as little as 0.6 gram was responsible for fatal renal injury. In a few of their cases deposits of crystals of the drugs in the urinary tract causing some degree of mechanical obstruction were found associated with the nephrotoxic lesion; this was not the

1. Klinge, F.: Beitr. z. path. Anat. u. z. allg. Path. **83**: 185, 1929.

2. Vaubel, E.: Beitr. z. path. Anat. u. z. allg. Path. **89**: 374, 1932.

3. Rich, A. R., and Gregory, J. E.: Bull. Johns Hopkins Hosp. **72**: 65, 73: 239, 1943.

4. Fox, R. A., and Jones, L. R.: Proc. Soc. Exper. Biol. & Med. **55**: 294 (April) 1944.

5. Fleisher, M. S., and Jones, L.: J. Exper. Med. **54**: 597 (Oct.) 1931.

1. Murphy, Francis D.; Kuzma, Joseph F.; Polley, Theodore Z., and Grill, John: Clinicopathologic Studies of Renal Damage Due to Sulfonamide Compounds, Arch. Int. Med. **73**: 433 (June) 1944.

rule, however, as in most of the cases the nephrotoxic lesions were independent of mechanical blocking. Microscopic alterations in tubular epithelium were observed all the way from simple degeneration to tubular necrosis and intense inflammatory reaction outside the nephron. The investigators feel that these tubular lesions represent degrees in the severity of one process rather than different kinds of response. The study failed to correlate the clinical features with the specific site for the renal tubular damage.

Of the numerous toxic complications caused by sulfonamide compounds, that affecting the kidney is most serious. Fortunately these complications are comparatively uncommon. The mechanical type of complication, particularly that outside the kidney, in the pelvis and the ureter, responds best to therapeutic measures. When, however, obstruction occurs within the kidney a cure is not easily accomplished, although always retrograde lavage should be done and the drug discontinued. Precipitation of the sulfonamide compound is the etiologic factor in these obstructions. Precipitation should be prevented as far as possible by the administration of adequate fluids and maintenance of an alkaline urine.

Current Comment

PLASMA LEVELS OF VITAMIN A AND CAROTENE IN RHEUMATIC SUBJECTS

The explanation for the greater frequency of rheumatic fever in persons in low income groups has been sought in a number of studies. Shank and his colleagues¹ recently determined the levels of vitamin A and carotene in the plasma on four groups of subjects whose intakes of vitamin A had been calculated. The first included 12 normal children in the high income class; their average daily intake was 109 per cent above the recommended amount for age and sex. The other three groups consisted of children with rheumatic infection who no longer showed signs of the active disease but whose diets contained varying quantities of vitamin A. Those in the second group were 24 children who received more than average amounts of vitamin A, their diets averaging 23 per cent above the calculated requirements. In the third group were 46 children who received vitamin A in adequate amounts with an average intake only 5 per cent in excess of calculated needs. The fourth group included 25 children with low vitamin intakes, the average for the group being 44 per cent less than optimum. The subsequent observations revealed a clearcut association between the levels of vitamin A and carotene in the plasma as related to the intake of vitamin A in the

diets. Regardless of the concentration of vitamin A or carotene in the plasma prior to the onset of active exacerbations of the disease, there is a fall in the level of vitamin A in the plasma with the development of acute rheumatic fever; the carotene in the plasma was not significantly altered quantitatively during rheumatic attacks. Furthermore, it was found that the degree of decrease of vitamin A in plasma varies directly with the intensity of the rheumatic attack. In the presence of severe attacks, concentrations in the plasma varied between 0 and 70 international units of vitamin A per hundred cubic centimeters of plasma. Delayed or decreased absorption of vitamin A was thus shown in patients with rheumatic fever. Nevertheless, uncertainty prevails as to whether vitamin A is destroyed in some abnormal manner or whether it is utilized normally but with increased speed of metabolism and that this accounts for its lowering in the presence of the active disease. Whether or not the vitamin A disturbance is a causative factor in the rheumatic process or merely a result of the process remains for further investigation.

DISHWASHING IN RESTAURANTS

The sanitary procedures of restaurant operation, including the adequacy of the methods of sanitizing eating and drinking utensils, are matters of general concern. Recently mobile laboratory units of the United States Public Health Service have cooperated with state and local health departments in making swab tests of restaurant utensils in numerous communities in different sections of the country. Unpublished reports of this work, according to Andrews,¹ reveal that improvement is needed in dishwashing methods in most, if not all, of the communities visited. This disappointing condition exists in spite of the availability of adequate information on choice of detergents and machine and hand washing technics. The fault is primarily in personnel. Frequently a person doing the dishwashing has not been properly instructed in technic. Good equipment is worthless if improperly operated. Since the outbreak of the war, the problem of maintaining good sanitation in restaurants has obviously become intensified by shortages of manpower, materials, increased customer loads and reduction of health department inspection facilities. In the face of evidence that the amount of disease spread in restaurants is increasing, health departments should intensify their efforts at control. Experience has shown that health authorities achieve the most satisfactory results by education rather than by policing. Properly organized training courses for employees of restaurants will probably prove more effective than any other one measure. As pointed out by Andrews, restaurant sanitation is an important public health activity, and wartime conditions with the probability of long continued overloading of restaurants in many areas gives this problem a special urgency.

1. Shank, Robert E., and others: The Level of Vitamin A and Carotene in the Plasma of Rheumatic Subjects, *J. Clin. Investigation* 23: 269 (May) 1944.

1. Andrews, John: Methods of Sanitizing Eating and Drinking Utensils, *Pub. Health Rep.* 59: 1103 (Aug. 25) 1944.

MEDICINE AND THE WAR

ARMY

NEW VACCINE TO PROTECT ARMY AGAINST SPREAD OF INFLUENZA

The War Department announced recently plans for the procurement and possible use of a vaccine to combat the spread of influenza in the Army, should the disease occur in epidemic form. The plans are based on evidence presented by the Commission on Influenza under the Army Epidemiological Board. The vaccine will not be administered routinely but will be given only on definite indication of the threat of influenza and only to personnel under risk of exposure to the disease. A statement of policy and a summary of the evidence for the prophylactic value of influenza vaccine was recently issued to all medical officers in a technical bulletin from the Office of the Surgeon General.

One of the main projects of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, ever since its establishment in 1941, has been the development of protection against influenza. This board, now called the Army Epidemiological Board, is under the presidency of Dr. Francis G. Blake, Dean of Yale University School of Medicine, New Haven, Conn. Under this board the Commission on Influenza, of which Dr. Thomas Francis Jr., professor of epidemiology at the University of Michigan School of Public Health, is director, was asked in 1943 to carry out a controlled clinical trial of the prophylactic efficacy against epidemic influenza viruses types A and B. In cooperation with a number of civilian and military agencies an extensive investigation was carried out. On the whole, the results showed that there was a reduction of about 75 per cent in the incidence of influenza among the vaccinated as compared with the unvaccinated controls and that loss of manpower hours was reduced because the illness in vaccinated persons was milder and shorter. The vaccine which was used was developed by Dr. Thomas Francis Jr., Dr. Jonas E. Salk and their associates.

BRIG. GEN. CHARLES R. GLENN APPOINTED DEPUTY AIR SURGEON

Brig. Gen. Charles R. Glenn, surgeon at the AAF Training Command, Fort Worth 2, Texas, has been appointed Deputy Air Surgeon. Col. Neely C. Mashburn, General Glenn's executive since July 1943, will succeed him. In his new assignment General Glenn will serve as assistant to Major Gen. David N. W. Grant, Surgeon on the Air Staff at AAF headquarters in Washington, D. C. Both General Glenn and Colonel Mashburn are Regular Army officers.

General Glenn, who graduated from Jefferson Medical College of Philadelphia in 1914, became a first lieutenant in the reserve on May 13, 1917. He was commissioned in the Regular Army before the end of the first world war. It was largely under his direction that training command surgeons, together with a group of highly specialized psychologists, developed the now famous system for the selection and classification of air crew trainees—pilots, bombardiers, navigators and gunners—a system designed to find the right man for the right job. In June and July of this year General Glenn made a sixty day world encircling inspection and observation flight during which he covered 40,000 miles, visiting U. S. combat air forces in every active theater except England and Alaska.

Colonel Mashburn graduated from Vanderbilt University School of Medicine, Nashville, Tenn., in 1914. He went overseas and served with the medical corps in Paris in February 1918 at the 18th Hospital of Evacuation and Operations south of Dunkirk, with the 32d, 29th and 88th divisions of the Alsace front in the x-ray section of a field hospital, with the Johns Hopkins unit in a general hospital center near General

Pershing's headquarters and finally at La Rochelle, just above Bordeaux. After his return to the United States in July 1919 he was ordered to the station hospital for the 1st Division at Louisville, Ky. From May 1920 to 1934 Colonel Mashburn experienced a variety of duty tours. He served as an instructor in the School of Aviation Medicine, Randolph Field, Texas, from 1934 to 1940. In 1941 he was appointed command surgeon for the Southeast Training Center at Maxwell Field. He became post surgeon at Ellington Field, Texas, in the Central Flying Training Command, known then as the Gulf Coast Training Center.

NEW PENICILLIN STUDY INSTITUTED AT FORT BRAGG

Dr. Charles Rammelkamp, member of the commission on Acute Respiratory Diseases, Epidemiological Board, Preventive Medicine Service, Office of the Surgeon General, and Capt. William Leifer, M. C., Regional Hospital, Fort Bragg, North Carolina, recently spent several days in the Office of the Surgeon General conferring on the new method of administering penicillin developed by Capt. Monroe J. Romansky, M. C., at the Army Medical Center. The new technic prolongs the action of penicillin by suspending it in a mixture of 4 per cent beeswax and peanut oil. Dr. Rammelkamp will act in a consulting capacity with Dr. Leifer, who is instituting a study of the method at Fort Bragg Regional Hospital. It is believed that the new method will have important effects on the use of this agent.

COL. ROBERT H. KENNEDY APPOINTED TO MAYO GENERAL HOSPITAL

Col. Robert H. Kennedy, former director of surgery at Beckman Hospital, New York, and attending surgeon at the New York Post-Graduate Hospital, has recently been appointed chief of surgical service at Mayo General Hospital, Galesburg, Ill. Dr. Kennedy, a veteran of World War I, succeeds Col. Emery Neff, former surgical chief, who left for treatment at Percy Jones General Hospital. Dr. Kennedy was called to active duty in World War II with the rank of lieutenant colonel in June 1942. He was promoted to colonel on April 3, 1943. Dr. Kennedy graduated from Columbia University College of Physicians and Surgeons in 1912.

DR. H. JACKSON DAVIS WITH ARMY CIVIL PUBLIC HEALTH DIVISION

Dr. H. Jackson Davis, chief medical officer of the State Department of Social Welfare, Albany, N. Y., has been granted military leave from the department to accept a commission as major in the newly established Civil Public Health Division, U. S. Army Medical Corps. The Civil Public Health Division will develop public health policies and practices in liberated and occupied countries in all war theaters, establish supervisory and liaison relations with local public health officials and provide certain essential medical supplies in those areas. Dr. Davis is a veteran of World War I. He graduated from Yale University School of Medicine, New Haven, Conn., in 1926.

MAJOR ALFRED GOLDEN GIVEN NEW ASSIGNMENT

Major Alfred Golden, formerly of Madison, Wis., who has been on duty for the past four years at the Army Medical Museum, has been transferred to the Division of Health and Sanitation, Office of the Coordinator of Inter-American Affairs. Dr. Golden will be assigned to duty in Latin America to study the pathology of certain tropical diseases.

TROOPS EXPOSED TO FILARIASIS PARASITE BEING OBSERVED AT WAKEMAN GENERAL HOSPITAL

More than five hundred servicemen who have been exposed to filariasis are being observed at the Wakeman General Hospital, Camp Atterbury, Indiana. Although the presence of the disease has been established in only a small percentage, the condition of none of the men is serious. The men were returned to the United States in accordance with War Department policy of evacuating military personnel from endemic regions after exposure to the disease in order to avoid complications that might develop following prolonged exposure. All the men just returned were evacuated after a comparatively short exposure to filariasis, and there is little likelihood that the more serious permanent consequences, including elephantiasis, will develop.

Transmission of the disease is possible only when immature forms of the parasite are circulating in the blood of an infected person. Such larval forms must be taken up by a mosquito in order to complete their development. None of these immature forms have been found in the blood of any of the returned soldiers. Consequently there is no risk that they will spread the disease in this country. Most of the men will receive furloughs, after which they will return to the convalescent hospital. It is expected that the majority will return to duty within a short time.

THIRTY-TWO MEDICAL OFFICERS RECEIVE REGULAR ARMY APPOINTMENT

Thirty-two medical officers who successfully completed examinations for regular army appointment held in January were nominated in the Senate recently and confirmed by that body as first lieutenants in the Regular Army Medical Corps. The officers who hold grades higher than those to which they are appointed in the Regular Army will retain such higher temporary grades. Those nominated were:

Capt. A. L. Baker Jr., Dover, N. J.	Capt. J. M. McIver, Boston.
Major B. H. Bennett, Washington, D. C.	1st Lieut. G. B. Milburn, San Antonio, Texas.
Capt. A. S. Blauw, Boulder, Colo.	Capt. T. M. Mulford, San Diego, Calif.
Major H. Boyd Jr., Kingston, N. Y.	Capt. J. R. Paul, Lincoln, Neb.
Capt. D. H. Cahoon, Roswell, N. M.	Lieut. Col. G. S. Richardson, Roswell, N. M.
Capt. J. S. Clapp, Erie, Pa.	Major H. L. Riva, Charleroi, Pa.
Capt. W. D. Dugan, Eugene, Ore.	Capt. J. N. Schaeffer, Miamisburg, Ohio.
Capt. H. V. Ellingson, Rochester, N. Y.	Capt. Edward Shaw, West Hartford, Conn.
Capt. R. C. Feamster, New Orleans.	Major F. R. Sloan, Marquette, Ia.
Capt. C. C. Flood, Ramsey, N. J.	1st Lieut. N. R. Spencer (M. Res.), Bethesda, Md.
Major E. J. Genetti, Bessemer, Mich.	1st Lieut. R. W. Thometz (M. Res.), Oak Park, Ill.
1st Lieut. F. E. Harrigan Jr. (M. Res.), West Hartford, Conn.	Capt. C. F. Vorder Bruegge, Memphis, Tenn.
Capt. K. D. Heuser, Denver.	Lieut. Col. J. E. Walther, Rushville, Ind.
Capt. R. R. Jones, Dallas, Texas.	
Major V. C. Kelly, Baltimore.	
Capt. K. A. Koerner, St. Louis.	
Capt. Robert Landesman, New York.	
Capt. R. E. Lau, York, Pa.	
1st Lieut. J. P. McEvoy (M. Res.), St. Paul.	

RECONDITIONING NEWS LETTER

A new publication, *Reconditioning News Letter*, is now being distributed monthly by the Office of the Surgeon General to all ASF hospital commanders and service command surgeons. Its aim is to familiarize hospital personnel with new ideas, practices and procedures connected with the reconditioning program. Sources of the items published are reports made by inspecting officers from the Surgeon General's Office, chiefs of the reconditioning branches in service commands, medical officers and others familiar with the program.

INCIDENCE OF POLIOMYELITIS AMONG U. S. TROOPS

In the two week period ended September 2, 20 cases of poliomyelitis were reported by army installations in the United States. This represents a slightly higher incidence than for the corresponding period last year. The total incidence since the first of the year is somewhat lower than in the corresponding eight month period of 1943. While most of the cases have occurred in the states which have a high civilian incidence of the disease, they have been widely scattered.

ADVANCE IN AURAL REHABILITATION PROGRAM

Borden General Hospital, Chickasha, Okla., has installed electroacoustical apparatus enabling it to fit the individual patient with the best combination of manufactured hearing aids. Such equipment is rarely found in civilian institutions and represents a progressive step in the aural rehabilitation program. Hoff General Hospital, Santa Barbara, Calif., and Deshon General Hospital, Butler, Pa., will be similarly equipped in the near future.

ARMY AWARDS AND COMMENDATIONS

Captain Cecil D. Conrad

The Soldier's Medal was recently awarded to Capt. Cecil D. Conrad, formerly of Highland Park, Mich. The citation accompanying the award reads "On March 22, 1944, when a fully loaded bomber crashed on takeoff at Decimemmanu, Sardinia, he observed that one engine was cutting out as the airplane sped along the runway and realized that a crash was imminent. He started his vehicle and arrived at the scene of the accident immediately after the plane struck. The terrific impact, which shattered and set fire to the B-26, killed one member of the crew and seriously injured others. With complete disregard for his own safety, and despite exploding ammunition and the great danger of fire setting off the bombs, he made his way into the wreckage and, with the aid of a comrade, removed the stricken crew members from the danger area. His heroism and selfless devotion to duty in risking his life to save others reflect highest credit on himself and the armed forces of the United States." Dr. Conrad graduated from Wayne University College of Medicine, Detroit, in 1941 and entered the service Oct. 24, 1941.

Major John Connell

Major John Connell, formerly of Des Moines, Iowa, has been awarded the Silver Star Medal "for gallantry in action in October 1943 in Italy. During an attack by an infantry regiment over a river Captain Connell followed the infantry across the river and by his own ingenuity organized routes of evacuation of battle casualties. All through the attack, which lasted two days, Captain Connell supervised the proper function of new routes and constantly reconnoitered to improve, shorten or hasten the evacuation even though the routes were under enemy fire. He made several trips across the river, which was still under enemy observation and heavy artillery and mortar fire. Undoubtedly the ingenuity and perseverance of Captain Connell, and the calm and courageous manner in which he performed his duties, saved the lives of many battle casualties and was instrumental in their being evacuated more quickly from the front lines. His coolness under fire and devotion to duty were exemplary and a credit to the armed forces of the United States." Dr. Connell graduated from Washington University School of Medicine, St. Louis, in 1937 and entered the service Feb. 10, 1941.

Captain Harlan Alfred Alexander

Capt. Harlan A. Alexander, formerly of Minneapolis, was recently presented with the Bronze Star Medal "for heroic achievement" in military operations against the Japanese on Attu Island in May 1943. The citation read "Capt. Harlan A. Alexander, Medical Corps, United States Army. For heroic achievement in connection with military operations against the enemy on May 16, 1943 during the Attu operation. After a furious battle an infantry company was forced to withdraw under withering enemy fire, leaving 5 casualties which had not yet been evacuated. After the withdrawal Captain Alexander, with complete disregard for his own safety, three times led a small group of aid men up a mountain and successfully evacuated 5 wounded men, although the entire route was over enemy terrain. His courageous action was an inspiration to the men of the battalion and resulted in saving the lives of 3 of the 5 wounded soldiers. His courage, coolness under fire and disregard for his personal safety reflect great credit on himself and the military service." Dr. Alexander graduated from the University of Minnesota Medical School, Minneapolis, in 1930 and entered the service Sept. 8, 1942.

NAVY

FIRST AID STATION AT GUAM

Seven machine guns set up in the windows of a besieged American first aid station held a bitterly contested sector of the Marine front lines for several hours recently at Guam. The station was commanded by Lieut. George W. Eldering, formerly of Los Angeles, who in desperation had asked for weapons support when the Japs ignored the aid station's immunity under international law and had launched an attack toward it. The station was located in a shell battered Jap storehouse well in advance of the Marine lines and had been established by Dr. Eldering and his men while some of the fighting of this campaign raged about them. "It was the best place we could find at the time," Dr. Eldering stated. "The front and side walls of the storehouse were still standing and offered some protection, though the roof and back wall were gone. After I had ordered the guns set up, I could find only five fit Marines to man them, so 2 of the patients took over the others. I ordered all patients evacuated immediately after first aid because I wasn't sure we could hold out for any length of time in that spot. Finally the orders came for us to fall back to a position about 500 yards behind the front lines. It was then we learned that our machine guns had held that part of the front alone."

NAVY AWARDS AND COMMENDATIONS

Lieutenant Commander Tom T. Flaherty

The Air Medal was recently awarded to Lieut. Comdr. Tom T. Flaherty, formerly of Long Beach, Calif. The citation accompanying the award read "For meritorious achievement in aerial flight as crew member of an R4D Transport Plane attached to the South Pacific Air Transport Command from July 15 to 25, 1943. When his craft was unable to land on the densely overgrown jungle terrain while transporting urgently

needed supplies to our forces on New Georgia Island, Lieutenant Commander Flaherty skilfully performed his duties and rendered invaluable assistance to his pilot in accurately dropping the cargo as the unarmed plane flew in at terrific speed and at tree top level to avoid intense enemy antiaircraft fire and aerial opposition, making several hazardous runs on the targets to complete the mission and frequently returning to base without the protection of covering planes. Lieutenant Commander Flaherty's cool courage and unwavering devotion to duty under extremely difficult conditions contributed materially to the success of these vital missions and were in keeping with the highest traditions of the United States Naval Service." Dr. Flaherty graduated from the University of Southern California School of Medicine, Los Angeles, in 1939 and entered the service July 14 of that year.

Lieutenant Commander Ben H. Keyserling

The Silver Star Medal was recently awarded to Lieut. Comdr. Ben H. Keyserling, formerly of Columbia, S. C. The citation accompanying the award read:

"While his unit was engaged with the enemy, Commander Keyserling displayed a high degree of courage, initiative and professional skill under the most hazardous of conditions.

"Dr. Keyserling, after all available stretchers had been evacuated to the rear with wounded, advanced to within a few yards of the front line assault companies, coolly and expertly treated wounded as they fell and evacuated them to the rear under heavy machine gun and rifle fire, for a full half hour.

"The fact that many were saved who would otherwise have perished may be attributed to Dr. Keyserling's courage . . . in the rendering of treatment. His actions were a great inspiration to all those with whom he came in contact and were in keeping with the highest traditions of the Navy."

Dr. Keyserling graduated from the Medical College of the State of South Carolina, Charleston, in 1940 and entered the service Aug. 28, 1941.

MISCELLANEOUS

TYPHUS COMMISSION MEDAL
AWARDED TO FOUR

The United States of America Typhus Commission Medal has been awarded by order of the President to Dr. Abdel Wahed El Wakil, Egyptian minister of health, and to three British brigadiers of the Royal Army Medical Corps for the help they have given representatives of the commission in investigating typhus in the Middle East and southern Italy. The members of the Royal Army Medical Corps are Brigadiers John S. K. Boyd, George B. Parkinson and Rudolf W. Galloway.

Dr. Wakil's citation reads:

"For meritorious services in connection with the work of the United States of America Typhus Commission. Ever since the arrival of the United States of America Typhus Commission group at Cairo, His Excellency, Dr. Wakil, as Minister of Health, has cooperated closely with the Commission. Through his interest and influence, facilities and opportunities were made available for the investigation of typhus fever in the laboratory and hospital, while extensive tests and new developments in methods for the control of typhus fever were made possible. The information derived from the results of these studies, conducted with the cooperation of Dr. Wakil, has been of benefit to the military forces."

The following is Brigadier Boyd's citation:

"For exceptionally meritorious service in connection with the work of the United States of America Typhus Commission. From the time of the arrival of the first contingent of the United States of America Typhus Commission at Cairo in January 1943 and throughout the remainder of that year, Brigadier Boyd assisted the commission in formulating and effectuating programs for research on typhus fever and in development of measures for control. He furnished detailed information concerning the incidence of typhus fever in British forces in the Middle

East in a manner which advanced coordination between American and British procedures for typhus control. Brigadier Boyd cooperated with the United States of America Typhus Commission in clinical studies, conducted to evaluate the properties of antityphus serum. In his capacity as a member of the Middle East Supply Center (Medical Section), Brigadier Boyd was extremely helpful and cooperative in arranging for distribution of typhus vaccine throughout the Middle East. Through his generous cooperation and through his many years of experience in the field of pathology, Brigadier Boyd as a consultant aided the Commission in practically every phase of its work in the Middle East."

Brigadier Parkinson's citation reads:

"For exceptionally meritorious service in connection with the work of the United States of America Typhus Commission. During the epidemic of typhus in Naples, in the period of Dec. 20, 1943 to Feb. 20, 1944 Brigadier Parkinson actively cooperated with the United States of America Typhus Commission and rendered service of the greatest value in support of the typhus control program in southern Italy. Through his assistance to the Commission measures which prevented the spread of typhus in southern Italy were greatly strengthened."

Brigadier Galloway's citation follows:

"For exceptionally meritorious service in connection with the work of the United States of America Typhus Commission. During the period of from Dec. 20, 1943 to Feb. 20, 1944, the critical period of the outbreak of typhus at Naples and in southern Italy, Brigadier Galloway actively supported the work of the United States of America Typhus Commission in southern Italy. In addition, he took special steps to see that the danger of typhus fever was brought to the attention of all British medical officers in the area. He initiated an active typhus control program throughout the entire military forces in southern Italy."

MALARIA EPIDEMIC DANGER IN U. S. IS REMOTE

Major O. R. McCoy, chief of the Tropical Disease Control Division in the Preventive Medicine Service of the Office of the Surgeon General of the Army, recently stated that he believed there is little danger of any serious epidemic of malaria in the continental United States traceable to soldiers returned from malarious battle fronts. It was reported recently that among soldiers the malaria situation has improved to a point where the effectiveness of combat units is no longer seriously threatened so long as "atabrine discipline" is properly maintained. Nevertheless some civilian authorities have indicated their fear that the return of malaria victims to the homeland might cause new epidemics or reestablish the disease endemically in areas which have not known it for several generations. Major McCoy stated that such fears are unwarranted. He pointed out that there is no reason to presume that mosquito control work, on which our principal dependence has been placed for malaria control, will not continue to operate effectively despite the presence of returned soldier victims. Brig. Gen. Hugh J. Morgan, head of the Medicine Division, who is chief consultant in medicine to Major Gen. Norman T. Kirk, Surgeon General of the Army, pointed out that the research work and experiences of the Army, Navy and other governmental agencies in malaria during this war have shed much light on many phases of the disease. "We are able to assure the American public that there is no reason for unfounded fears of malaria, if the disease is properly treated," he said.

Every soldier in a malarious area receives "suppressive treatment"—a small dose of atabrine six days a week, which controls the disease if he should contract it while in the lines and keeps him functioning as part of his unit. If the disease should develop, or if it appears after he is withdrawn to a nonmalarious rest area, he is given substantially larger curative doses, repeated each time the disease reappears. Most victims of vivax malaria have one relapse. At the same time the soldier is trained to protect himself against the mosquito which transmits the infection. He is supplied with mosquito netting, with mosquito repellents and "mosquito bombs" to clear out his tents or living quarters, and he is taught not to expose himself at sunrise or sunset.

HEALTH NEWS FROM EUROPE

Public health work in Naples, after the initial cleanup and refitting of hospitals, was largely a matter of modernizing and supplementing the efforts of the Italian civilian government. Drug supplies and equipment were imported and modern developments in technics applied. Rapid treatment centers for victims of venereal disease were instituted and hospitals established for prostitutes. Wider case finding was stimulated and steps in education were undertaken.

Special emphasis also was laid on malaria control measures, on sanitation to prevent typhoid and dysentery infections and on antityphus work. Owing to overcrowding and lack of water and soap, an epidemic of lice borne typhus was building up when the Allies moved into Naples.

Typhus is a seasonal disease, and the number of cases usually begins to increase in the fall and winter and reaches its peak in April and May. It is particularly virulent among the underfed and poorly housed parts of the population, and during and after the last war it literally killed millions in eastern Europe. In Naples public health measures taken under the direction of the allied military government and the Typhus Commission of the United States stopped the epidemic cold for the first time in history. In January nearly 1,000 cases were reported, in February there were fewer than 200 cases, and in March case incidence was unimportant.

A few sporadic cases still occur in Naples, but the strenuous delousing campaign, use of repellent powders perfected for the U. S. Army and the immunization with U. S. Army vaccine of civilian public health workers proved effective. Exact figures on the death toll of the epidemic have not yet been assembled, but the rates ran about as usual, from 4 per cent among children to 54 per cent among persons over 70 years old. There were no cases among Allied soldiers. Naples had not had a reported case of typhus for fifteen years prior to this outbreak.

Records of the local régime were so confused that it was possible to form no clear picture of previous health averages for Naples, but current conditions in the city are described by the Army as good. Typical of the Fascist records was an instance applying to a Sicilian city in which certain buildings were listed as hospitals with so many beds allotted for civilian care. Some of the buildings so listed were actually houses of prostitution.

LIEUT. OLIVER AUSTIN MISSING IN ACTION.

Dr. Jean Austin, wife of Lieut. Oliver Austin, who has been missing in action since July 5, will carry on her husband's work. He vanished after taking off on a mercy flight July 5 from Churchill, Canada. His destination was Eskimo Point, 160 miles north, where he hoped to check an epidemic among the Eskimos and forestall danger of its spreading to the United States Army Air Force station near Churchill, where he was post surgeon. Searching parties found the plane wrecked on July 9 on a submerged reef in the Hudson Bay. The pilot's body was found but no trace of Lieutenant Austin. Dr. Jean Austin, who is resident surgeon at Cook County Hospital, Chicago, plans to leave for the isolated Hudson Bay outpost, 1,000 miles north of Winnipeg, where there are no other doctors for a distance of 600 miles, as soon as possible. Drs. Jean and Oliver Austin both graduated from Northwestern University Medical School, Chicago, in 1943 and 1941, respectively. Dr. Oliver Austin entered the service in September 1943.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, September 23, page 242)

CALIFORNIA

Stanford University Hospitals, San Francisco. Capacity, 372; admissions, 9,588. Dr. Anthony J. J. Rourke, Superintendent (residents—surgery, obstetrics and gynecology, anesthesia, psychiatry, medicine, October 1).

ILLINOIS

Walther Memorial Hospital, Chicago. Capacity, 209; admissions, 5,665. Mr. William C. Martens Jr., Superintendent (3 interns).

MICHIGAN

Saginaw General Hospital, Saginaw. Capacity, 151; admissions, 3,961. Mrs. Kate J. Hand, Superintendent (intern).

MISSOURI

Christian Hospital, St. Louis. Capacity, 135; admissions, 3,201. Miss Agnes Heman, R.N., Superintendent (2 interns, 1 resident, mixed service).

NEW YORK

Beth David Hospital, New York City. Capacity, 187; admissions, 3,985. Mr. Harold M. Salkind, Executive Director (6 interns, October 1). Ellis Hospital, Schenectady. Capacity, 470; admissions, 14,385. Miss Mary G. McPherson, R.N., Administrator (interns, resident, mixed service, October 1).

TENNESSEE

Protestant Hospital, Nashville. Capacity, 222; admissions, 4,895. Mrs. Elizabeth S. Hain, R.N., Superintendent (3 residents—mixed service).

WASHINGTON

Pierce County Hospital, Tacoma. Capacity, 239; admissions, 2,768. Dr. Burton A. Brown, Administrator (intern, October 1).

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Mayo General Hospital, Galesburg, Ill.: Blood Dyscrasias, Drs. Louis R. Limarzi and Howard L. Alt, October 4.

Camp Ellis, Camp Ellis, Illinois: Orthopedic Problems of General Interest, Drs. Edward L. Compere and Paul B. Magnuson, October 4.

Chanute Field, Rantoul, Ill.: Gallbladder and Liver Disease, Drs. Andrew C. Ivy and Walter L. Palmer, October 4.

ORGANIZATION SECTION

WASHINGTON LETTER

(From a Special Correspondent)

Sept. 25, 1944.

Sensenich Urges Physical Fitness Program

A nationwide program of physical fitness, "not a Hitler youth movement, but routines of living for the purpose of hardening or attainment of physical vigor," was advocated by Dr. R. L. Sensenich of the Board of Trustees of the American Medical Association in his testimony before the Pepper committee. He was the first witness called at the opening of the past week's three day session, when the health condition of four to five million young American men found physically and mental unfit for the armed forces was under discussion.

"The greatest significance in reports of rejections for the armed forces," said Dr. Sensenich, "would seem to be in the notable lack of self interest and effort to secure or maintain a high level of mental and physical fitness. Those without recognizable defects fail to observe even the simplest program of regulation or discipline directed to the maintenance of good health. Routines of living for purposes of hardening or attainment of physical vigor are often referred to only with contempt."

Dr. Sensenich revealed that plans are well along for the broadest national activity to stimulate an interest in physical fitness. These are directed to homes, schools, churches, labor and industry and social and professional groups. This activity is being organized under leadership of a joint committee for the American Medical Association and the Committee on Physical Fitness of the Federal Security Agency. The work will be financed from many private groups. Dr. Sensenich estimated that approximately one out of six men were rejected because of remediable defects. Failure was most often due to lack of interest or willingness to accept treatment to correct conditions rather than to inability to obtain such medical service. He said that there are numerous provisions for those unable to pay for medical service. Final failure to obtain needed medical care, if it is sought, he said, generally rests on failure of some agency of government to carry out the purpose for which it is directed to assist those in need. On the question of availability of medical care, he said that the Procurement and Assignment Service for Physicians, Dentists and Veterinarians had done an excellent job in preventing serious depletion of medical personnel where their services were needed by the civilian population.

Cutting Hospital and Medical Costs for Wage Earners

Dr. C. Rufus Rorem, director of the Hospital Service Plan Commission of the American Hospital Association, told the Pepper committee that if the government provided all necessary medical and hospital care for the indigent, doctors and hospitals could reduce their rates so much that all wage earners, even with very low incomes, could probably provide such care for themselves and their families. Dr. Rorem said that providing hospital and medical service for beneficiaries of public assistance, who at most make up no more than 15 per cent of the population, may seem a trivial procedure that avoids the basic need of adequate care for all the people, but he declared that it "strikes directly at the heart of an important economic problem of sickness. If the hospitals and physicians were individually (and as groups) relieved of financial responsibility for care of the indigent public," he said, "the subscription rates and hospital payments of the Blue Cross plans might be reduced to make participation possible by even the low income employed person and his dependents."

During the past week's hearing, views of labor leaders were expressed. The American Federation of Labor went on record as believing that the remedy to the national health problem lies in the principle of social insurance to apply to the health needs of all the people. Its spokesmen were in favor of the programs for hospitals and district hospital centers proposed by Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service.

In addition to the American Medical Association spokesmen, testimony was given by Professor Walter W. Palmer, chair-

man, Committee on Postwar Medical Service, American College of Physicians; Dr. Jean Curran, dean, Long Island College of Medicine and member of the board, Bingham Associates Fund; Dr. Samuel Proger, medical director, Pratt Diagnostic Hospital, Boston; Dr. Victor Heiser, chief medical consultant, National Association of Manufacturers; Dr. Leverett D. Bristol, chairman, Health Advisory Council, U. S. Chamber of Commerce; Dr. John P. Peters, secretary, Committee of Physicians for Improvement of Medical Care; Dr. George Stevenson, medical director, National Committee for Mental Hygiene; Dr. E. I. Robinson, president, National Medical Association; Dr. Ernst P. Boas, chairman, Physicians Forum; Dr. John Radford Boling, president, Florida State Medical Society; Dr. Perry Prather, general practitioner, Hagerstown, Md., and Dr. T. Henshaw Kelley, secretary, California Physicians Service.

Commission on Children Urged by Pepper Committee

Three recommendations from the Pepper Subcommittee on Wartime Health and Education, made at the conclusion of sittings here this past week when the juvenile delinquency problem was discussed, were (1) Establishment of a commission for children and young people in the Office of War Mobilization, (2) fuller participation of children in the home front war effort through a central administrative authority and (3) national publicity and educational policy to acquaint the people of the United States fully with facts about children and their needs.

Juvenile delinquency, the hearings indicated, does not have any single cause, and it cannot be cured by any single remedy. Prevention is believed to be the soundest approach to the problem, the committee found from testimony of witnesses with experience in child health and welfare. Many governmental agencies are struggling with the problem, but overall leadership and coordination are needed. It was pointed out in a summary of testimony that, although there are at least twelve agencies in the federal government alone performing special services for children, the services of none of them, from the Children's Bureau to the Federal Bureau of Investigation, can be spared. Nor is there any federal agency known to the committee which is set up in a way to provide adequate leadership and coordination in delinquency prevention.

Veterans Hospital Facilities Extended

Addition of 14,100 beds to the hospital system of the Veterans Administration has been given presidential approval, reports Brig. Gen. Frank T. Hines, chairman of the Federal Board of Hospitalization. This includes approximately 2,700 beds for mental patients, 7,900 for general medical and surgical care and 3,500 for tuberculous patients. This program is in addition to projects already approved for 17,400 beds in mental hospitals, 2,100 for general medical and surgical patients and 500 for the tuberculous. It is reported that most of the 20,000 beds are already under construction. Altogether, 34,100 beds are to be added to present Veterans Administration hospitals.

The latest program was approved after a nationwide study of prospective needs for veterans' hospitals, made jointly by the Veterans Administration and the Federal Board of Hospitalization. The study does not recommend individual sites for new hospitals or suggest where additions should be made. The way is cleared now for detailed planning by the Veterans Administration.

General Hines said that planning for future hospitalization of veterans must be continued. Locations will be chosen and hospitals designed two or three years in advance, the presidential approval having ordered that the whole program be reviewed frequently.

It is estimated that there will eventually be about 112,700 hospital beds available for veterans' care, and of the 27,700 to be made available for 1947 some 5,700 are for Veterans Administration patients in other federal, state and private hospitals. Adding some 12,800 beds that will be available for domiciliary care, a grand total of about 125,500 beds will be available ultimately to veterans.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CONNECTICUT

Society News.—Dr. Joseph Jordan Eller, New York, will address the Waterbury Medical Society, November 9, on, "Tumors of the Skin."

Yale Library Acquires Herb Cabinet.—The Yale Medical Library recently acquired the herb cabinet of Dr. Seth Bird (1733-1805), Bethlehem. The *Connecticut State Medical Journal* reported that no Connecticut physician of his time was more famous as a practitioner or medical preceptor than Dr. Bird. On June 14, 1941 the Beaumont Medical Club of Connecticut paid tribute to Dr. Bird in a visit to his house, which at that time was owned by Mr. William B. Sprague of New York City. On this occasion Dr. Creighton Barker, New Haven, presented a paper on Dr. Bird.

DISTRICT OF COLUMBIA

Personal.—Dr. Hugh H. Hussey Jr. has been named chairman of a medical advisory committee appointed by the district office of price administration to pass on all applications for extra food rations for convalescents and persons in ill health. Other members of the committee are Drs. Roy L. Sexton, Roger O'Donnell Jr., Thomas F. Collins Jr. and James M. Moser. —Dr. Nelson Mercer, medical officer at Virginia Polytechnic Institute, Blacksburg, Va., has been named chief medical officer of the tuberculosis division of the Gallinger Municipal Hospital, effective August 1. Dr. Mercer succeeds Dr. Charles P. Cake, who resigned to enter the U. S. Public Health Service. —Dr. Herbert P. Ramsey has been appointed chairman of the health division of the Council of Social Agencies.

Blood Bank Incorporated.—The new community blood plasma bank, successor to the former Office of Civilian Defense blood bank, has been incorporated and will soon begin operation, according to *Medical Annals* (THE JOURNAL, June 24, p. 587). Dr. Roger M. Choisser is the new president of the bank, and members of the governing board include Dr. John A. Reed vice president, Dr. Charles Stanley White, Dr. Oscar B. Hunter, Dr. John M. Orem and Fred A. Walker of the Central Labor Union secretary-treasurer. Plans are to maintain bank supplies with contributions by patients after they recover or by their friends. It will be a nonprofit organization, and plasma will be available at the cost of production plus a donation of blood.

ILLINOIS

Personal.—Dr. Joseph S. Maxwell, formerly missionary to Ethiopia, has been appointed physician at Wheaton College, it is reported.

Chicago

The Bevan Lecture.—Dr. Howard C. Naffziger, professor of surgery, University of California Medical School, San Francisco, will deliver the sixteenth annual Arthur Dean Bevan Lecture before the Chicago Surgical Society, October 6. The subject of his lecture will be "Exophthalmos and the Thyroid: Experiences with Major Surgery of the Orbit."

Mr. Shepard Joins Saunders Company as Art Editor.—Mr. Willard C. Shepard, for many years connected with Rush Medical College and recently Rush associate in illustration studios at the University of Illinois College of Medicine, has been appointed art editor of W. B. Saunders Company, publishers, Philadelphia and London, in which position he will be available for consultation with authors in the preparation of illustrations for important textbooks. Mr. Shepard studied under the late Professor Max Brödel of Johns Hopkins University School of Medicine, Baltimore. Since 1916 he has been medical artist to Rush Medical College and the Presbyterian Hospital and for the past several years a general faculty member of the department of illustration of the University of Illinois College of Medicine. In his new work Mr. Shepard will concentrate on the more effective utilization of medical illustration to the benefit of medical education and clinical practice.

INDIANA

Personal.—Dr. Love E. Pennington, superintendent of the Milledgeville, Ga., State Hospital, has been appointed to a similar position at the Madison State Hospital, North Madison.

Medical School Affiliates with St. Elizabeth Hospital.—An affiliation of St. Elizabeth Hospital, La Fayette, with the Indiana University School of Medicine, Indianapolis, for postgraduate instruction of the hospital's interns and staff has been announced by Dr. Willis D. Gatch, dean of the medical school. The affiliation, which was requested by Sister M. Amelia, superintendent, and Sister M. Renata, librarian, of the La Fayette hospital is the first of a series of joint arrangements by which the university's school of medicine will extend its facilities to local hospitals. The university will outline the training, send members of the faculty to conduct monthly meetings of interns and staff, and conduct examinations. The major portion of the instruction will be conducted by La Fayette physicians under Dr. Franklin S. Crockett, director of postgraduate instruction of St. Elizabeth Hospital.

LOUISIANA

New Diagnostic Center.—The New Orleans Diagnostic Center has been opened in the old criminal courts building for the examination of women arrested for violations of the moral code. Women found to be infected with venereal diseases will be sent to the Delgado Memorial Hospital, a unit of Charity Hospital, New Orleans.

Anton Carlson to Give New Lecture.—Dr. Anton J. Carlson, professor emeritus of physiology, University of Chicago School of Medicine, will deliver the first lecture to be given at the Tulane University of Louisiana School of Medicine, New Orleans, October 2, under the newly created Alpha Omega Alpha Lectureship. Established by the Tulane University Stars and Bars chapter of Alpha Omega Alpha, one lecture will be given each academic year on the initiation of new members. Twelve Tulane students will be initiated on October 2 in addition to Dr. Hiram W. Kostmayer, dean of the medical school, who has been chosen an honorary member.

Symposium on the Heart and Circulation.—The Louisiana State University School of Medicine, New Orleans, will conduct a symposium on the heart and circulation, October 25-27. There will be no fee. Those interested are invited to attend. Among the speakers will be Drs. Maurice B. Visscher, University of Minnesota Medical School, Minneapolis, who will discuss cardiac efficiency and metabolism; Isaac Starr, University of Pennsylvania School of Medicine, Philadelphia, the ballistocardiograph, and Frank N. Wilson, University of Michigan Medical School, Ann Arbor, electrocardiography. Other speakers will be from Tulane University of Louisiana School of Medicine and Louisiana State University.

MASSACHUSETTS

Nutrition Instruction.—The Harvard School of Public Health through its department of nutrition is expanding its teaching activities in nutrition. Nutrition A, consisting of three lectures per week for the first semester (November through February) covers the following subjects: proteins; fats; carbohydrates; minerals; vitamins; water; foods as sources of nutrients; nutritional requirements versus recommended allowances; losses of food nutrients in processing and the enrichment and fortification of foods; food habits; nutrition in relation to pregnancy, lactation, childhood, adolescence, dental health, medicine and blood regeneration; the use and abuse of commercial vitamins and mineral preparations; food fads versus facts; food budgeting; evaluation of nutritional status—dietary histories, laboratory methods, clinical studies, surveys; evaluation of diets; mass feeding; nutrition in industry; the nutritionist in a public health program; tools for nutrition education; nutritional problems of rehabilitation; nutrition in preventive medicine and public health. Nutrition B is offered throughout the entire year and consists of practical experience under supervision in food clinics in a community nutrition project or in experimental nutrition, depending on the student's qualifications and interests. Nutrition C, a weekly journal club and seminar in nutrition covering both fundamental and applied nutrition, meets throughout the academic year.

NEBRASKA

The C. W. M. Poynter Foundation.—Alumni and friends of Dr. Charles W. M. Poynter, dean of the University of Nebraska College of Medicine, Omaha, have set up an endowment fund to establish the C. W. M. Poynter Foundation. The purpose of the foundation will be to create a Poynter lectureship and fellowship at the college of medicine and the

painting of a portrait of Dr. Poynter. Persons wishing to contribute to the fund should address Dr. Willson B. Moody, treasurer of the foundation, 530 Medical Arts Building, Omaha 2.

NEW JERSEY

Brandenburg Arrested for Illegal Narcotic Sale.—Dr. Leopold W. A. Brandenburg, 57 years old, Union City physician who in recent years has been involved in several criminal complaints (*THE JOURNAL*, July 11, 1942, p. 893 and Sept. 12, 1942, p. 135), was arrested by federal narcotic agents, September 12, on a charge of illegally selling narcotics. He was held in \$5,000 bail to await action by the federal grand jury. Assistant United States Attorney Charles Stanziale said the charges involved the sale of morphine to "four or five drug addicts over a period of time." The arrest was made by federal narcotic agents at the physician's office at 2802 Hudson Boulevard, Union City.

Court Orders Physician Restored to Civilian Job.—The U. S. Circuit Court of Appeals for the Third District, Philadelphia, in its first decision construing terms of the amendment to the Selective Service Act which requires employers to reinstate returned veterans to their jobs, ruled on September 12 that a medical director for an industrial corporation is an employee within the meaning of the law and entitled to his old job after discharge from the armed forces, according to the *New York Times*. The unanimous decision, written by Judge William H. Kirkpatrick, orders the General Cable Corporation at Perth Amboy, N. J., to reinstate Dr. Albert E. Kay, Perth Amboy, as the company's medical director. Dr. Kay enlisted in December 1942, after he was classified 1-A by his draft board, and attained the rank of captain in the army before he was discharged for physical disability. The company refused to rehire him, claiming that he was an independent contractor rather than an employee. It also contended that, since an employees' health association for which Dr. Kay had been medical examiner had engaged another physician and refused to take Dr. Kay back, it would be more beneficial to the employees if the same doctor was medical director for both the company and the association. Judge Kirkpatrick ruled that the law does not say a returned veteran must be an employee but is intended to protect "a position in the employ of an employer" and that Dr. Kay held such a position. As to the company's contention that there would be "loss of efficiency" and "additional expense" if separate doctors were employed by the company and the employees' association, Judge Kirkpatrick said that if such a claim was upheld it "would defeat the main purpose of the act and limit its operation to merely capricious or arbitrary refusals." The ruling was made on an appeal taken by Dr. Kay from a decision handed down by Judge Thomas F. Meaney of the New Jersey Federal District Court last February 7 dismissing a lawsuit the doctor had filed to compel the company to reinstate him.

NEW YORK

Cancer Teaching Day.—On October 17 a cancer teaching day will be held at the Hermann M. Biggs Memorial Hospital, Ithaca, under the auspices of the Medical Society of the County of Tompkins, the state medical society and the division of cancer control of the state department of health. The speakers will be Drs. John H. Garlock, New York, and John J. Morton Jr., Rochester, on "Carcinoma of the Colon" and "Bone Tumors" respectively. An evening session will be addressed by Drs. Andrew H. Dowdy, Rochester, on "Epithelioma of the Skin" and Frank E. Adair, New York, "Carcinoma of the Breast."

Graduate Lectures.—On October 31 Dr. Frank L. Meleney, New York, will discuss "Penicillin Therapy" before the Nassau County Medical Society in Rockville Centre. Dr. Foster Kennedy, New York, discussed "The Neuroses: Related to the Manic-Depressive Constitution" before the Otsego County Medical Society, September 13, and Dr. Stockton Kimball, Buffalo, addressed the St. Lawrence and Jefferson county medical societies, September 14, on "The Diagnosis and Treatment of Malaria and the Dysenteries." These lectures are jointly sponsored by the state medical society and the state department of health.

New York City

Gastroenterology Conferences.—Bellevue Hospital announces a series of conferences on gastroenterology beginning October 2 and continuing every Monday throughout the coming year. The sessions will consist mainly in the presentation of a clinical, pathologic and radiologic study of current abdominal cases that have come to operation or necropsy.

Meeting on Diabetes.—The New York Diabetes Association was addressed September 28 at the Blumenthal Auditorium, Mount Sinai Hospital, New York, by Drs. Martin G. Goldner and George Gomori, both assistant professors of medicine at the University of Chicago School of Medicine, on "Alloxan Diabetes" and "Histology of the Normal and Diseased Pancreas" respectively.

Columbia Receives Penicillin.—A grant of 100,000 Oxford units of penicillin was recently made to students of the College of Pharmacy at Columbia University for demonstration purposes, newspapers reported August 30. The drug is not suitable for human consumption, it was stated, but will prove an important addition to the laboratory to enable pharmacy students to gain first hand knowledge of the drug.

Million Dollar Fund for Crippled Children.—The Association for the Aid of Crippled Children, 580 Fifth Avenue, will receive about 10 million dollars under the will of Mrs. Annie Kirk Belding, who died September 4. The late Mrs. Belding's husband, Milo M. Belding, who died in 1931, had provided that the income from a trust fund after the death of his wife was to go to the association. The gift will be known as the Milo M. Belding Fund.

Health Education.—The Health Education Committee of the National Publicity Council for Health and Welfare Services, Inc., announces two health education clinics at the Hotel New Yorker, New York, October 2. One on printed matter, to be addressed by Milton Glover, Arthur Kudner Advertising Agency, and Horace H. Hughes, director of public information, Maternity Center Association, will be a practical analysis of printed pieces and posters in the health field. The second, on radio, will be a clinical discussion of the various types of radio programs; speakers will be Paul F. Lazarsfeld, director, Office of Radio Research, Columbia University; Harrison B. Summers, manager, public service division, Blue Network, and Herta Herzog, radio research department, McCann Erickson Advertising Agency.

Mayor Vetoes Boric Acid Bill.—Mayor Fiorello H. La Guardia recently vetoed the Vogel bill passed by the city council, which would require that all boric acid products be labeled "poison," according to the *Journal of the Medical Society of the County of New York*. The mayor based his veto on three main points:

1. He doubted that the jurisdiction or police powers of the city council covered the subject.
2. He regarded the question as one of a highly technical and medical nature, more properly and wisely entrusted to the board of health.
3. He preferred opinions of several medical authorities, including Dr. Ernest L. Stebbins, city health commissioner, and Dr. Edward S. Godfrey Jr., state health commissioner.

It was stated that Mayor La Guardia found that the amendment to the sanitary code, recently passed by the city board of health and effective September 15, adequately meets all the precautions. The amendment governs the handling for purposes of selling of boric acid in the form of powder, crystals or solutions unless the container contains a label with the words "boric acid" and "Caution—Not for Internal Use Except as a Mouth Wash, Eye Wash or Douche."

PENNSYLVANIA

Philadelphia

Personal.—Gustav J. Martin, Sc.D., has been appointed research director of the National Drug Company; he has been assistant director in charge of the division of chemistry for the Warner Institute for Therapeutic Research, New York.

Joint Medical Meetings.—On September 13 the Philadelphia County Medical Society and the College of Physicians of Philadelphia opened their regular joint medical meetings with a talk, among others, by Dr. Reginald H. Smithwick, Boston, on "Experiences with the Surgical Treatment of Hypertension." Subsequent speakers will include:

- John F. Enders, Ph.D., Boston, Immunity in Mumps (John Herr Musser Lecture), October 4.
- Dr. Andrew C. Ivy, Chicago, The Gastrointestinal Hormones, Their Physiology and Application, November 8.
- Dr. Stanley P. Reimann, The Cancer Problem as It Stands Today (Thomas Dent Mutter Lecture), December 6.
- Dr. George W. Thorn, Boston, Asthenia of Adrenal and Thyroid Origin—Differential Diagnosis and Treatment, January 10.
- Dr. Chester S. Keefer, Boston, Penicillin (Nathan Lewis Harpell Lecture), February 7.
- Dr. Joe V. Meigs, Boston, The Delay Period in the Diagnosis of Cancer, March 14.
- Dr. Charles C. Wolfarth, The Diagnosis of Coronary Artery Disease (Mary Scott Newbold Lecture), April 4.

SOUTH CAROLINA

Personal.—Dr. Henry W. Tobias, for more than six years chief medical officer of the Veterans Administration Facility, Columbia, has resigned. Newspapers report that he will return to Washington to live.—Dr. Caleb W. Harris, Bishopville, recently completed fifty years in the practice of medicine.

Executive Director Named for Ten Point Program.—Mr. M. L. Meadors, Florence, a practicing attorney, has been elected executive director of the "ten point program" sponsored by the South Carolina Medical Association (THE JOURNAL, June 17, p. 505). The program was launched September 1 and is intended to raise the level of medical care for all people of South Carolina and keep the practice of medicine in the hands of the medical profession. The plan was approved at the recent annual meeting of the state medical association. Mr. Meadors formerly served as a member of the South Carolina House of Representatives.

Refresher Courses.—The Medical College of the State of South Carolina, Charleston, will conduct its third annual refresher course November 1-3 with the following speakers: Drs. Hilger Perry Jenkins, Chicago; Albert David Kaiser, Rochester, N. Y.; Eugene M. Landis, Boston; Bret Ratner, New York; Harold George Wolff, New York; George Edward Pfahler, Philadelphia; Paul Titus, Pittsburgh; Henry N. Harkins, Baltimore, and Julius Lane Wilson, New Orleans. Dr. Victor Johnson, Secretary of the Council on Medical Education and Hospitals, American Medical Association, Chicago, will address the banquet session on founders day, November 2, on "Medicine After the War." A special session on physical medicine will be held Friday in the Stark General Hospital Medical Library. The speakers will include Lieut. Col. Charles H. Fair, M. C., Major John G. Reid, M. C., Capt. Arthur M. Pruce, M. C., on "Physical Medicine and War Injuries" and Lieut. Elizabeth Kelly, P. T. A., and Captain Pruce on "Peripheral Nerve Injury: The Role of Splinting and Physical Therapy in Preoperative and Post-operative Care," a demonstration. A refresher course organized by the South Carolina Society of Ophthalmology and Otolaryngology will be conducted October 31 to November 2, among others, by Drs. Henry M. Goodyear, Cincinnati; James S. Shipman, Philadelphia; James W. White, New York, and Oscar V. Batson, Philadelphia.

TEXAS

Memorial to Dr. Randall.—The amphitheater in the outpatient clinic building of the University of Texas Medical Branch, Galveston, has been named Randall Hall in honor of the late Dr. Edward Randall, professor emeritus of therapeutics, formerly chairman of the board of regents of the University of Texas and chairman of the board of directors of the Sealy and Smith Foundation. Dr. Randall died August 12.

Changes in the Faculty at Baylor.—The following appointments to the clinical faculty of the Baylor University College of Medicine, Houston, have been announced:

- Dr. Theodore R. Hannon to associate professor, clinical surgery.
- Dr. Frank O. McGehee to associate professor of orthopedic surgery.
- Drs. John E. Skogland and Zidella M. S. Brenner to associate professors, clinical neuropsychiatry.
- Dr. Paul R. Stalnaker, associate professor, clinical urology.
- Dr. A. Louis Dippel, Salt City City, to associate professor, obstetrics.

WEST VIRGINIA

Advisory Committee Named for Physical Restoration Program.—A professional advisory committee to the physical restoration section of the West Virginia board of vocational education has been appointed by the West Virginia State Medical Association at the request of F. Ray Power, director of the new division "because of their outstanding contribution in a similar advisory capacity to the adult physical restoration program of the department of public assistance." Members of the committee are Drs. Thomas H. Blake, St. Albans, and Hugh A. Bailey and Thomas G. Reed, Charleston. The physical restoration program of the division of vocational rehabilitation includes provisions for surgical, medical and psychiatric care, hospitalization, physical therapy, occupational therapy and artificial appliances for clients who meet the criteria for eligibility for the services of the division and who are medically indigent. The duties and responsibilities of the professional advisory committee will include meeting from time to time to advise the division of rehabilitation and the supervisor of physical restoration with respect to general policies, setting of standards, selection of rates and methods of payment for services, supplies and prosthetic appliances, methods of medical

reporting and record keeping by case workers, and assisting in interpreting to the professional personnel and institutions participating in the program the policies and procedures adopted by the state board of vocational education. Dr. Norman G. Angstadt, Fayetteville, director of the bureau of county health work of the state department of health, has been named as part time medical (administrative) consultant. His work will include day to day consultation with the supervisor of physical restoration in individual cases and specific medical problems, advice with regard to the execution of the policies for physical restoration, assistance to the supervisor in representing the state agency in its contacts with the medical and associated professions, assistance in the maintenance of the standards established by the state agency for the selection of physicians, hospitals and other medical personnel and facilities qualified to serve various types of cases and for payment to physicians, hospitals and others, and assistance in training the rehabilitation case work staff. The physical restoration program is already functioning with medically indigent clients being provided with such prosthetic appliances, surgical correction and therapeutic treatment as is necessary to restore them to physical fitness for jobs in industry, which is the objective of all physical restoration in the new division.

GENERAL

National Hearing Week.—The week beginning October 22 has been designated National Hearing Week and will be devoted to the theme "Twenty-Five Years of National Service in the Cause of Better Hearing." The observance will be emphasized at the twenty-fifth anniversary meeting of the American Society for the Hard of Hearing at the Waldorf-Astoria Hotel, New York, November 10-12. This will be the eighteenth annual observance of National Hearing Week.

Graduate Courses.—The American College of Physicians has announced its autumn postgraduate courses, the first on cardiology, to be held at the Massachusetts General Hospital, Boston, October 2-7. Other courses include:

General Medicine, University of Oregon Medical School, Portland, October 9-14.

Internal Medicine, Center for Continuation Study, University of Minnesota Medical School, Minneapolis, October 9-14.

Allergy, Roosevelt Hospital, New York, October 16-21.

Special Phases of Internal Medicine, various Chicago institutions, October 23-November 4.

Special Medicine, various Philadelphia institutions, December 4-15.

Dr. Hanson Joins Red Cross.—Dr. Millard C. Hanson, who recently resigned as city health director of Richmond, Va., has been appointed medical director for the American Red Cross in charge of the Pacific area, with headquarters in San Francisco. Dr. Hanson will have charge of medical activities of the Red Cross in seven Western states and the territory of Alaska. Dr. Hanson, who graduated at Rush Medical College, Chicago, in 1923, served in the Richmond position for more than eight years.

New Journal of Clinical Psychology.—A new *Journal of Clinical Psychology* will make its debut in January 1945 under the auspices of the University of Vermont College of Medicine, Burlington. Dr. Frederick C. Calkins, Burlington, Vt., is the editor. The new publication seeks to improve interprofessional relations between psychology and psychiatry. It will appear quarterly and will be limited to the publication of original research reports and of authoritative theoretical articles in the field of clinical psychology. The journal hopes to bring about closer understanding between psychology and the medical profession particularly in the borderline fields of psychometrics, guidance, counseling, child development and remedial work with speech, reading and special disabilities.

Special Society Elections.—Dr. Walter A. Younge, St. Louis, was chosen president-elect of the National Medical Association at its annual meeting in St. Louis, August 17, and Dr. Emery I. Robinson, Los Angeles, was installed as president. Other officers are Dr. John T. Givens, Norfolk, Va., general secretary, and Dr. Eugene T. Taylor, St. Louis, treasurer. The 1945 session is planned for Louisville, Ky.—Will Ross, a director of the Wisconsin Anti-Tuberculosis Association, Milwaukee, was recently chosen president-elect of the National Tuberculosis Association at its meeting in Chicago. Mr. Ross is the first layman to be elected to this office in thirty-two years and the second in the association's history.

Cancer Society Changes Name.—The American Society for the Control of Cancer, Inc., has changed its name to the American Cancer Society, Inc. In the future the society's lay organization, the Women's Field Army, will be known as

and sequential courses in both fields. A series of motion picture sessions will be run during the meeting. There will be alumni dinners and luncheons. The sixth annual meeting of the American Association of Eye, Ear, Nose and Throat Society Secretaries, Wednesday evening, October 11, will be devoted to extension study courses for eye, ear, nose and throat societies presented by Dr. William L. Benedict, Rochester, Dr. Gradle, Dr. Dean M. Lierle, Iowa City, and Dr. Albert D. Ruedemann, Cleveland. The American Orthoptic Council will hold an examination Saturday, October 7, at 2 o'clock at the Illinois Eye and Ear Infirmary. The American Board of Otolaryngology will hold its examinations at the Palmer House, October 4-7. Part I of the examination of the American Board of Ophthalmology will be held at the Edgewater Beach Hotel October 5-6 and part II at the Illinois Eye and Ear Infirmary October 7. The American Orthoptic Council and the American Association of Orthoptic Technicians will hold a joint symposium Sunday with the following speakers: Miss Jean Robinson, Memphis, on "Follow-Up in Orthoptics"; Dr. Frank D. Costenbader, Washington, D. C., "Analysis of Failures in the Treatment of Squint," and Miss Louisa Wells, Washington, "Orthoptic Fictions and Misconceptions." Other scientific programs will be concerned with the conservation of hearing, industrial ophthalmology and otosclerosis study group. A feature of the academy meeting will be a symposium on "Head and Face Pain" by Drs. Walter I. Lillie, Philadelphia; Arthur W. Proetz, St. Louis; Bayard T. Horton, Rochester, and Lewis J. Pollock, Chicago.

MEDICAL BILLS IN CONGRESS

Bills Introduced.—S. 2144, introduced by Senator Andrews, Florida, proposes to provide more efficient dental care for the personnel of the United States Navy. It provides for a director of the Dental Corps of the Navy with the rank, pay and allowances of a rear admiral, provides for the establishing on ships and on shore stations of dental services to be administered under the senior dental officer, and authorizes the Secretary of the Navy to provide for a suitable number of dental technicians of appropriate ratings and ranks and for their training, detail, retention, supervision and direction by appropriate dental officers. S. 2163, introduced by Senator O'Mahoney, Wyoming, for himself and Senator Ferguson, Michigan, proposes to incorporate the Medical Women, Army-Navy Club. The objects of the corporation will be (a) to endow a memorial to honor nurses of the Army and Navy who served as officers of the armed forces in World War II, (b) to maintain a domicile for the comfort and service of all women who have served as commissioned officers of the Medical Departments of the Army and Navy, (c) to establish a club to aid in the continuance of the high morale of the medical women of the armed forces, (d) to provide a place of meeting and room accommodations and to promote entertainment for the best interest and efficiency of the medical women officers of the armed services and (e) to engage in such other activities for the promotion of the general welfare of the women commissioned officers as the corporation shall from time to time determine. H. R. 5265, introduced, by request, by Representative Pace, Georgia, provides for the development of better diets and an improved nutritional status for the people of the United States. H. R. 5388, introduced by Representative Bradley, Pennsylvania, proposes that no member of the land or naval forces of the United States shall be required to pay the cost of his transportation from an army or navy hospital in which he is a patient, or from any other hospital or institution in which he is undergoing treatment at the expense of the United States, to another such hospital or institution on the ground that such transfer was made at his own request. H. R. 5402, introduced by Representative Fay, New York, proposes an appropriation of \$3,000,000 to construct a Veterans' Administration general medical and surgical hospital and domiciliary facility in the Borough of Manhattan, city of New York. H. R. 5414, introduced by Representative King, California, proposes to construct in Los Angeles a marine hospital for the accommodation of approximately 300 bed patients.

LATIN AMERICA

Health Activities in Latin America.—DDT Experiments. —The Puerto Rico Insular Health Department is planning a series of experiments with DDT (dichloro-diphenyl-trichloro-ethane) insecticide to determine its efficiency and effects on human beings, livestock and agriculture, provided permission to purchase DDT can be obtained from the War Production Board in Washington. The department's malaria control bureau is preparing a report on projected experiments with DDT which will be submitted to the War Production Board. Experiments are planned with the insecticide in marshes for the destruction of mosquitoes.

Personal.—Dr. Emilio Mattar, who has been doing post-graduate work at Michael Reese Hospital, Chicago, returned to Brazil July 24. He has received an appointment to set up and direct a metabolism laboratory in the department of medicine of the University of São Paulo.

Medical Congress.—The second Pan American Conference on Leprosy will be held in Rio de Janeiro sometime in 1945, the exact dates to be chosen later.

Program Against Typhus.—The Guatemalan government has signed a contract with the United States for a cooperative campaign of sanitation to end typhus and eliminate malaria from the middle highlands of Guatemala. The New York Times reports that the cost was expected to be \$600,000, of which Guatemala will provide \$300,000 and will borrow an equal sum from the United States to be repaid in four years. The work will be carried out by both Guatemalan and American experts and technicians.

Health in Panama.—An excellent water system is the first reason for the success of public health work in Panama City, Colon and the Canal Zone, says Brig. Gen. Henry C. Dooling, M. C., chief health officer of the Panama Canal. Health conditions in these communities are highly satisfactory, it was stated, and will tend to remain so if the soundness of the water system, which was "hard to surpass," is maintained. Typhoid will be eliminated once sewage disposal facilities are removed from harbors and beaches, General Dooling stated. A joint sewage disposal board, made up of Canal Zone and Panama representatives, is now at work on long range plans for the coordination of sewage disposal in the Sabanas, Bella Vista, Panama City and Balboa districts. General Dooling also stated that Panama's high tuberculosis rate is attributable to poor housing conditions. Good results are expected from the extensive housing projects undertaken by the recently organized Urbanization Bank. The "liquidation" of Panama's rat population would expel another health menace confronting the people of the republic.

FOREIGN

Jeffries Prize Goes to Air Marshal Whittingham.—The Institute of Aeronautical Sciences announced September 3 that the annual John Jeffries Prize for contributions to aeronautical medical research has been awarded to Sir Harold E. Whittingham, Director General, Medical Services of the Royal Air Force.

Nutrition Research Unit.—A human nutrition research unit has been established by the British Medical Research Council, London, with Dr. Benjamin S. Platt as director, Science reports. The unit is already engaged in investigations affecting colonial nutrition and is offering hospitality for study and research to nutrition workers from the colonies. It will also be available to advise colonial governments on technical questions.

Ophthalmic Gold Medal.—The Ophthalmological Society of Egypt announces that a gold medal will be awarded annually for the contribution deemed most valuable that year in the field of ophthalmology. A competitive essay will determine the award, which will be considered at the annual congress of the society. Additional information may be obtained from the Ophthalmological Society of Egypt, Dar el Hekma, 42 Kasr el Ainy Street, Cairo.

Deaths in Other Countries

Sir Hugh Mallinson Rigby, "sergeant surgeon" to King George V from 1928 to 1932. He performed an operation credited with saving the king's life in 1928. Sir Hugh died July 17.—**Dr. Juan Carlos Llamas Massini**, professor of obstetrics, Faculty of Medical Sciences of the University of Buenos Aires, and president of the Society of Obstetrics and Gynecology, Buenos Aires, died July 2.—**Sir Humphry Rolleston**, physician to the late King George the Fifth, died at his home in Surrey, September 24, aged 82.

CORRECTION

Iodized Table Salt to Combat Goiter.—The Brazil Letter published in THE JOURNAL September 9, page 120, under the paragraph "Iodized Table Salt to Combat Goiter," stated that the product shall contain 10 mg. of iodine per kilogram of table salt. This presumably should have been 100 mg. of potassium iodide per kilogram, which conforms with the usual proportions followed in this country.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 26, 1944.

Questionnaire on the National Health Service

Some months ago the British Medical Association issued a questionnaire to the whole medical profession on the proposed national health service. Forms were sent to 53,728 physicians, and replies were received from 25,435, or 48 per cent. A large number of forms were sent to physicians in the fighting services. The following are the most important questions and a summary of the replies: Is your reaction to the white paper of the government favorable or unfavorable? The replies were 39 per cent favorable and 53 per cent unfavorable; 6 per cent did not know. Will the country's medical service be improved or suffer? Thirty-two per cent thought it would be improved, 12 per cent that it would be unaffected and 44 per cent that it would suffer. In 1943 the representative meeting of the British Medical Association voted that any national health service should be confined to 90 per cent of the public and exclude the 10 per cent upper income group. The white paper proposes that every one should be included but that no one should be required to use it. Should this basic proposal be accepted? It was accepted by 60 per cent and refused by 37 per cent. Should complete hospital and specialist services be available to every one in a general ward? Sixty-nine per cent of the answers were favorable to this. Should a patient who wanted to choose his own hospital or go into a private or semiprivate ward be permitted to pay a "hotel charge" and still receive medical attention under the service? The answers were 41 per cent affirmative and 54 per cent negative. Two out of every three voters approved the principle of health centers. Should the buying and selling of practices be maintained or abandoned on the assumption that adequate compensation is paid to existing owners? Thirty-three per cent were in favor of maintaining this practice and 56 per cent were against it. Thus the replies to the questionnaire reveal a greater difference of opinion than was supposed to exist.

The Problem of the Rheumatic Child

The Cardiac Society and the British Pediatric Association have prepared a joint report on the care of rheumatic children. It states that acute rheumatism is primarily a disease of school age, that means of prevention are not known, and that efficient treatment depends on early diagnosis and methods known to limit cardiac damage. Three measures are proposed: (1) establishment of cardio-rheumatic clinics where the diagnosis can be established early and certainly, (2) organization of hospital schools where children can be treated as long as necessary while education continues and (3) compulsory notification of all cases of acute rheumatism, chorea and rheumatic heart disease. These steps might first be tried in large cities with medical schools where an appropriate staff can be found. The clinic should be held weekly and associated with a key hospital where laboratory facilities are available, the report states. The patients could be used for teaching, it is pointed out. The clinic should undertake supervision and follow-up, which should be continued into adult life. The staff should include physicians experienced in children's and heart diseases and should have the help of an assistant physician or registrar. Besides having access to a laboratory for sedimentation rates, blood counts and biochemical investigations, the clinic should be equipped with the means to measure heights and weights, to screen and x-ray hearts and to take electrocardiograms. The clinic physicians should arrange treatment to minimize cardiac damage, supervise the

life of the children, collect data on prevention, direct adolescents and adults into suitable occupations, and educate doctors in the diagnosis of acute carditis and other heart diseases, the report says.

Hospitals for the treatment of children with cardiac rheumatism should be established throughout the country. The serious results of rheumatic carditis require that all cases of suspected acute rheumatism, chorea and rheumatic heart disease in children under the age of 16 should be made notifiable. A committee should be formed to keep the clinics in touch with one another and to coordinate research.

Proposed Register of Specialists

In this country the status of specialists is well recognized, but they have no legal status apart from that of physicians in general. A special committee appointed by the General Medical Council (which, among other matters, controls medical registration) to consider the formation and maintenance of a register of specialists has issued its report. This recalls that last February the council reaffirmed its view that it is desirable and in the public interest that a register of specialists should be formed and maintained by the council. The immediate object of such a register would be to provide the authorities responsible for the organization of specialists' services as part of the proposed national health service and, in particular, the authorities for making appointments of specialists in that service, with an authoritative means of ascertaining whether or not any particular registered medical practitioner is eligible for appointment. The future object of the register of specialists would be to establish a standard of postgraduate medical qualification and experience for those who can be accepted for registration by the council.

Institute for Research and Teaching of Ophthalmology to Be Established in London

The plan to establish at Oxford University a center of ophthalmic research and postgraduate study has been reported in *THE JOURNAL* (June 17, p. 507). A similar plan has now been formed in London. The council of the Royal Eye Hospital has decided to establish an Institute of Ophthalmology where teaching and research can be carried out systematically and coordinated with the work of laboratories and general hospitals. The institute, with an independent board of governors, will work under the patronage of the Archbishop of Canterbury, the Archbishop of Westminster and other prominent persons. To ensure that the institute is broadly established, panels of advisers have been set up to help in planning and carrying out the work. These include eminent scientists, physiologists, physicians, surgeons and ophthalmologists. The courtesies of the institute will be available to all ophthalmologists, and offers of cooperation will be welcomed.

The F.R.C.S. in Ophthalmology

The fellowship of the Royal College of Surgeons is the highest surgical qualification in England and is held by the leading ophthalmic surgeons, who have obtained it by the same examination that general surgeons undergo. But, in this age of specialism, an innovation has been proposed. The Council of British Ophthalmologists has asked the council of the Royal College of Surgeons to grant a special diploma of the college as a higher diploma in ophthalmology. The council of the college has given this request careful consideration and agrees that a special examination would be more suitable than the usual final fellowship examination for those specializing in this important branch of practice. It is also clear to the council that the present regulations for the "F.R.C.S. with Ophthalmology" are too exacting in that candidates are required to have passed the usual final examination of the fellowship. The council members therefore agree that there should be a special

final examination for the fellowship for those specializing in ophthalmology and that, since the standard would be comparable to that of the usual final examination, successful candidates should rank as fellows of the college, with all their privileges. Under the existing charters the council has no right to make this arrangement, but it is prepared to seek it. It is anticipated that two ophthalmic surgeons will be required on the examination board. It is proposed that they should be fellows of the college. Two other surgical members of the examination board would be selected from the general surgeons on the court of examiners and would take part in some portions of the theoretical examination.

Woman Professor of Obstetrics and Gynecology

Mrs. Bertram Lloyd has been appointed to the chair of obstetrics and gynecology in the University of Birmingham, left vacant by Sir Harold Beckwith Whitehouse, who died when he was president of the British Medical Association. Mrs. Lloyd graduated in science in 1914 and in medicine two years later at Birmingham University. She then became medical officer to the Maternity Hospital and the Midland Hospital for Women. In 1920 she took the fellowship of the Royal College of Surgeons and became obstetric surgeon to the Maternity Hospital and acting surgeon to the Hospital for Women. In 1930 she married Mr. Bertram Lloyd, who is professor of forensic medicine and lecturer on clinical surgery at the University of Birmingham. Mrs. Lloyd was appointed assistant to the chair of obstetrics before succeeding to it.

AUSTRALIA

(From Our Regular Correspondent)

July 17, 1944.

Deficiency of Thiamine in the Australian Diet

The average diet eaten by the Australian is estimated to contain about 1.2 mg. of thiamine daily per "adult male." Many diets are much lower than this, and there are probably few people in Australia whose thiamine intake is up to the National Research Council standard of 1.8 mg. per day for the moderately active man.

The Nutrition Committee of the National Health and Medical Research Council has given consideration to measures designed to increase the thiamine content of the Australian ration. These studies were directed along two lines: (a) the raising of the percentage of extraction from flour and (b) the enrichment of the flour with synthetic nutrients.

The first line of study showed that there were considerable technical difficulties associated with the manufacture of high extraction flour. Most of the flour milled in Australia is "straight run" flour. Milling practice in Australia does not divide the flour into separate types, as is the practice in other countries, nor is the general standard of milling machinery in Australia as good as elsewhere. Many Australian mills fall far short of what is necessary for the manufacture of good flour even at normal percentages of extraction. The redesigning of the machinery for making high extraction flour in Australia would necessitate the use of skilled manpower, which is not at present available. Furthermore, the climatic conditions and the long distances in Australia are not conducive to the long storage of high extraction flour.

The so-called mill offal (bran and pollard) is more than fully utilized in the feeding of poultry and dairy animals, and the production goal for the product of these animals has increased considerably. The estimated requirement of these mill by-products is already in excess of the available supply. New Zealand, moreover, requires about 60,000 tons yearly of bran and pollard.

On the basis of an 80 per cent extraction flour the amount of vitamin B₁ supplied by bread made from this flour would be

about 50 per cent greater than that provided by bread made from the present white flour of 70-72 per cent extraction. The use of an 80 per cent extraction flour would increase the total thiamine intake of the Australian citizen living on an average diet by about 10 per cent. This 10 per cent would come almost entirely from the pollard fraction of the offal. This would mean that up to two thirds of the supply of pollard would be withdrawn and the remaining third would not have the same nutritional value for animal feeding as that now produced. Accordingly, the committee did not feel justified in recommending the introduction of a flour of high extraction (80-85 per cent) for the manufacture of bread in lieu of white flour of 70-72 per cent extraction.

The baking interests in Australia are opposed to the baking of either whole meal or high extraction flour. They fear that such bread, in that it differs from that acceptable to the Australian palate by custom, would tend to be consumed in smaller quantities. Their activities have been directed toward an advertising campaign to encourage the consumption of more white bread. This campaign has been notorious for its misleading, inaccurate statements.

The Nutrition Committee of the National Health and Medical Research Council was opposed to the enrichment of flour with synthetics on the ground that "there is no evidence that vitamin B₁ produces its complete nutritional effect by its own unaided physiological action."

Estimations of the thiamine content of Australian wheat and flour during one season have shown that the thiamine content of Australian wheat is higher than it is in wheats from other countries; but, even so, bread made from Australian flour provides only 0.34 microgram of thiamine per nonfat calory. As it is considered that complete metabolism is achieved only with a ratio of 0.5 microgram of thiamine per nonfat calory, it will be seen that the Australian white bread does not carry sufficient thiamine for its own complete oxidation.

The Australian army in its field bakeries produces bread of either 40 per cent wheat meal or 6 per cent wheat germ. This bread is estimated to provide 43 micrograms of thiamine per ounce. This compares with white bread at 25 micrograms per ounce and whole meal bread at 71.

The Australian army and air force have banned the sale of "ready to eat" breakfast foods by army canteens. This was done as a result of analyses which showed that there was an average thiamine destruction in the factory preparation of 94 per cent in the leading brands. The practice had developed of army units substituting the thiamine rich oatmeal and wheat meal issue by such devitaminized foods. No "ready to eat" breakfast food in Australia is enriched by synthetic nutrients.

The increasing taste and demand for sugar among service personnel also is causing some concern.

Marriages

HENRY L. HARRIS, Los Angeles, to Miss Mary Wallace Austin in Alabama, June 15.

LAWRENCE J. O'NEIL to DR. CORNELIA ST. ROMAIN, both of New Orleans, May 23.

NELSON A. WOLFE to Miss Betty Denny, both of New Albany, Ind., August 24.

EDWARD G. RIVET, New Orleans, to Miss Judith McMahon of Clinton, La., June 10.

JAMES V. KAUFMAN to Miss Elizabeth H. Toye, both of New Orleans, June 3.

JAMES M. BUIE, Mertens, Texas, to Miss Margaret Stell of Irene in July.

VERNON N. BALOVICH, New Orleans, to Miss Sue Fernandez, May 25.

Deaths

Edward Clarence Moore ☉ Los Angeles; University of Southern California College of Medicine, Los Angeles, 1904; clinical professor of surgery at his alma mater; founder member of the American Board of Surgery; member of the American Surgical Association and the American Urological Association; member and past president of the Pacific Coast Surgical Association; fellow of the American College of Surgeons; at one time on the staff of the Mayo Clinic, Rochester, Minn.; during World War I served as major and consulting surgeon in the medical corps, American Expeditionary Forces, stationed at Base Hospital number 26; past president of the state fish and game commission; chief surgeon and a founder of the Moore-White Clinic; on the staffs of the California, Cedars of Lebanon and Good Samaritan hospitals; died July 10, aged 62; of carcinoma of the left kidney with metastasis to the lungs.

Lester Low Watson ☉ Passed Assistant Surgeon, U. S. Public Health Service Reserve, Milton, Mass.; Boston University School of Medicine, 1928; member of the Massachusetts Medical Society; fellow of the American College of Physicians; formerly instructor in medicine at his alma mater; served as visiting physician and secretary of staff, Massachusetts Memorial Hospitals, Boston, and visiting physician, Milton Hospital and Convalescent Home; formerly examiner, tuberculosis division, Boston Health Department; examining physician, Randolph District, Massachusetts Selective Service; formerly chief of the Milton Civilian Defense; recently stationed at the U. S. Public Health Service Hospital, Sheepshead Bay, Brooklyn, where he died June 14, aged 43, of coronary occlusion.

Ralph Farnsworth Harloe ☉ Brooklyn; Long Island College Hospital, Brooklyn, 1918; also a pharmacist; since 1937 assistant clinical professor of surgery at his alma mater; fellow of the American College of Surgeons; past president of the Brooklyn Surgical Society; served as special examiner for the U. S. Civil Service Commission and the U. S. Veterans Bureau in Washington, D. C.; served during World War I; on the staffs of the Sea View Hospital, Staten Island, Long Island College Hospital, Kingston Avenue, Bushwick, Evangelical Deaconess and Bay Ridge hospitals; director of thoracic surgery at the Kings County Hospital, where he died July 31, aged 64, of coronary occlusion.

William Figures Lewis ☉ Colonel, U. S. Army, retired, Pasadena, Calif.; University of Maryland School of Medicine, Baltimore, 1893; entered the army as an assistant surgeon in 1893; became a major in the medical corps of the U. S. Army in 1908, a lieutenant colonel in 1916 and a colonel in 1917; retired Dec. 15, 1922 after twenty-nine years' service; received the Distinguished Service Cross for bravery in action during the Philippine Insurrection; served in the Boxer Rebellion in China and the Spanish-American War; chief surgeon of the Allied Expeditionary Forces in Siberia during World War I; died September 10, aged 78, of arteriosclerotic heart disease.

Michael Milton Lucid, Syracuse, N. Y.; Syracuse University College of Medicine, 1896; member of the Medical Society of the State of New York; member of the House of Delegates of the American Medical Association in 1915; fellow of the American College of Surgeons; served during World War I; colonel in the medical reserve corps of the U. S. Army not on active duty; formerly on the staff of the Cortland County Hospital, Cortland, and a founder of the Homer Hospital, Homer; died in the Hospital of the Good Shepherd, Syracuse University, July 11, aged 75, of lobar pneumonia, generalized arteriosclerosis and acute nephritis.

James Cornelius Austin, Spencer, Mass.; College of Physicians and Surgeons, Baltimore, 1896; member of the Massachusetts Medical Society; past president of the Worcester District Medical Society; chairman of the board of health for twenty-five years and school physician for many years; died July 10, aged 69, of cerebral hemorrhage.

Paul Harold Bikle ☉ Mifflinburg, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1904; formerly on the staff of the University Hospital, Philadelphia; served as company surgeon for the Williamsport District of the Pennsylvania Railroad; died in the Harrisburg Hospital, Harrisburg, July 30, aged 65, of coronary occlusion.

James Walter Van Blaricum ☉ Minneola, Kan.; Kansas City (Mo.) Medical College, 1901; for many years member of the school board; died June 4, aged 70, of bronchial asthma.

George Proctor Cooper ☉ Angels Camp, Calif.; Cooper Medical College, San Francisco, 1906; served as county health officer and county physician; chief examiner for the Calaveras County Selective Service Board during World Wars I and II; commissioner, Angels Fire Department; for many years president of the board of education; superintendent of the Calaveras County Hospital; died in St. Luke's Hospital, San Francisco, July 18, aged 64, of carcinoma of the colon.

Channing Ellery Dakin, Mason City, Iowa; Bennett College of Eclectic Medicine and Surgery, Chicago, 1899; member of the Iowa State Medical Society; fellow of the American College of Surgeons; served as health officer of Mason City; attending surgeon and chief of staff, St. Joseph's Mercy Hospital; died July 8, aged 68, of carcinoma of the colon.

Alice Mabel Woods Fiddes, Morgan Hill, Calif.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1885; died July 24, aged 83, of arteriosclerotic heart disease.

James Berry Gilbert ☉ Tulsa, Okla.; Mississippi Medical College, Meridian, 1912; served as county physician; on the staffs of the Hillcrest Memorial and St. John's hospitals; died July 4, aged 55.

Fred Thomas Hauser ☉ Purcellville, Va.; Medical College of Virginia, Richmond, 1933; on the staffs of the Loudoun County Hospital, Leesburg, and the Winchester Memorial Hospital, Winchester; died July 25, aged 41, of brain tumor.

William James Latimore, Herminie, Pa.; Eclectic Medical Institute, Cincinnati, 1897; examiner of schools and in 1902 school director; died in the Westmoreland Hospital, Greensburg, July 16, aged 72, of peptic ulcer.

John H. Runyon, Seymour, Iowa; College of Physicians and Surgeons, Keokuk, 1890; member of the Iowa State Medical Society; died July 30, aged 77, of coronary thrombosis.

Frederick Parker Scribner, Manchester, N. H.; Dartmouth Medical School, Hanover, 1909; member of the New Hampshire Medical Society and the American Society of Anesthetists, Inc.; on the staffs of the Hillsborough County General Hospital, Grasmere, and the Elliot Hospital; died in Bedford July 17, aged 60, of coronary thrombosis.

Isaac Grafton Sieber Jr. ☉ Passed Assistant Surgeon, U. S. Public Health Service Reserve, Cleveland; Temple University School of Medicine, Philadelphia, 1932; intern and a staff member at the St. Alexis and Glenville hospitals; on the staff of the Booth Memorial Home and Hospital; entered the U. S. Public Health Service in 1942 and was assigned to the Coast Guard in Boston; died August 5, aged 39, of carcinoma of the left lung.

Lewis C. Snell, Neosho, Mo.; University Medical College of Kansas City, 1900; died in St. John's Hospital, Joplin, July 20, aged 79, of myocarditis.

Charles Ira Stephen, Ansonia, Ohio; Starling Medical College, Columbus, 1897; member of the Ohio State Medical Association; past president of the Darke County Medical Society; served in the medical corps of the U. S. Army during World War I; a member of the board of education and for many years a member of the county board of health; on the staff of the Wayne Hospital, Greenville, where he died July 13, aged 70, of carcinoma of the liver.

M. Eugene Street ☉ Glendon, N. C.; College of Physicians and Surgeons, Baltimore, 1893; on the staff of the Moore County Hospital, Pinchurst, where he died July 14, aged 78, of coronary occlusion.

Basil Mitchell Taylor, Portland, Ind.; University of Louisville (Ky.) Medical Department, 1892; member of the Indiana State Medical Association; for many years secretary of the Jay County Medical Society; health officer of Portland; formerly state senator in Kentucky; served as secretary-treasurer of the staff of Jay County Hospital; died July 10, aged 74, of coronary occlusion.

John Quincy Thomas ☉ Conshohocken, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; served two terms as president of the Conshohocken town council and for many years as president of the Mary H. Wood Park commission; a trustee of the Norristown State Hospital, Norristown, for eighteen years; on the staffs of the Bryn Mawr Hospital, Bryn Mawr, and the Montgomery Hospital, Norristown, where he died July 26, aged 69, of cerebral arteriosclerosis.

George S. Trotter, Olney, Ill.; Kentucky School of Medicine, Louisville, 1898; served as president of the board of education and on the inductees examining board during World War I; died July 23, aged 75, of arteriosclerosis.

DIED WHILE IN MILITARY SERVICE

Melbourne Wells Boynton • Chicago; Rush Medical College, Chicago, 1935; diplomate of the National Board of Medical Examiners; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; served an internship at St. Luke's Hospital; chief resident and later on the attending staff of the Chicago Lying-In Hospital and Dispensary; resident in obstetrics at the Chicago Maternity Center and the University of Chicago Clinics; instructor of obstetrics and gynecology, University of Chicago School of Medicine; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on Aug. 26, 1935; began active duty on March 7, 1941, in charge of obstetrics and gynecology at the William Beaumont General Hospital, El Paso, Texas; later promoted to captain, major and lieutenant colonel; chief, medical safety division with headquarters at the Army Air Forces, Office of Flying Safety, Winston-Salem, N. C.; killed in an experimental parachute jump from high altitude at Clinton County Army Air Base, Wilmington, Ohio, August 19, aged 39.

George Kremer Rhodes, San Francisco; Johns Hopkins University School of Medicine, Baltimore, 1915; diplomate of the National Board of Medical Examiners and founder member of the American Board of Surgery; associate clinical professor of surgery at the University of California Medical School; member of the California Medical Association, Western Surgical Association and Pacific Surgical Association; fellow of the American College of Surgeons; associate visiting surgeon, San Francisco Hospital, and assistant chief surgeon, San Francisco Emergency Hospital; volunteer surgeon of the American Ambulance Corps in France during World War I; commissioned a lieutenant colonel in the medical reserve corps of the U. S. Army on Dec. 20, 1940; began extended active duty on May 15, 1942; served overseas with the 30th General Hospital (affiliated unit of the University of California Medical School) and later became surgical consultant in the southern district of the European theater, where he died July 23, aged 54, of coronary occlusion.

Lloyd Thomas Sussex • Havre, Mont.; Northwestern University Medical School, Chicago, 1926; diplomate of the National Board of Medical Examiners; fellow of the American College of Surgeons; intern at the Wesley Memorial Hospital, Chicago, from July 1925 to April 1927; later fellow in surgery at the Mayo Foundation in Rochester, Minn.; served on the staffs of the Sacred Heart and Kennedy Deaconess hospitals; commissioned a lieutenant in the medical corps of the U. S. Naval Reserve on Feb. 10, 1937, promoted to lieutenant commander on June 30, 1942 and commander on Oct. 1, 1942; spent eighteen months in the South Pacific area, four months at Guadalcanal, some time in New Zealand and was in the battle of Tarawa; had been given honorable mention for having performed operations on 140 wounded men during seventy-two consecutive hours; died in the U. S. Naval Hospital, Farragut, Idaho, June 8, aged 45, of coronary thrombosis.

Martlin Pendry Smith, Erie, Pa.; University of Pittsburgh School of Medicine, 1933; member of the Indiana State Medical Association; specialist certified by the American Board of Otolaryngology; served an internship at the Pittsburgh Medical Center, a residency in obstetrics at the Elizabeth Steel Magee Hospital, Pittsburgh, a residency in eye, ear, nose and throat at the Buffalo General Hospital and the Children's Hospital in Buffalo, and the New York Polyclinic Medical School and Hospital, New York; formerly a member of the visiting staff of the Ball Memorial Hospital, Muncie, Ind.; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on June 2, 1941; later promoted to lieutenant and lieutenant commander; died in the African area on July 5, aged 35, of injuries received in an automobile accident.

Morton Atherton Cundiff, Somerset, Ky.; University of Louisville School of Medicine, 1941; served an internship at St. Joseph Hospital, Lexington; commissioned a

first lieutenant in the medical corps, Army of the United States, on May 26, 1942; began active duty on July 2, 1942; later promoted to captain; flight surgeon in the Air Corps; died in the European theater of operation July 4, aged 29, of injuries received in an airplane accident.

Foster Leonard Dennis • Dodge City, Kan.; Jefferson Medical College of Philadelphia, 1921; served during World War I; fellow of the American College of Physicians; commissioned a major in the medical corps, Army of the United States, on Feb. 24, 1943; formerly stationed at the Walter Reed General Hospital, Washington, D. C., and formerly attached to the Twenty Second General Hospital; died June 26, aged 48, of cerebral hemorrhage.

Judge William Fuller, Assistant Surgeon Lieutenant (jg) U. S. Navy, Jacksonville, Fla.; Tulane University of Louisiana School of Medicine, New Orleans, 1942; served an internship at the Naval Hospital, where he had been on the staff; drowned at sea in the Atlantic area January 7, aged 28.

Julian Leo Hargrove • Bartow, Fla.; Emory University School of Medicine, Atlanta, Ga., 1924; served in the U. S. Navy during World War I; superintendent of the Polk County Hospital for many years; commissioned a lieutenant commander in the medical corps of the U. S. Naval Reserve on March 28, 1942; executive medical officer of the Deland Naval Air Station; died July 3, aged 46, of injuries received when his automobile struck a bridge abutment on the Deland-Daytona Beach Highway.

Charles Albert McNeil • Toledo, Ohio; University of Michigan Medical School, Ann Arbor, 1923; completed an internship and served on the staff of St. Vincent's Hospital; served during World War I; commissioned a lieutenant commander in the medical corps of the U. S. Naval Reserve on July 2, 1942; senior medical officer of the Naval Officer Procurement in St. Louis; had also been stationed in Chicago; died in the U. S. Naval Hospital, Great Lakes, Ill., July 27, aged 51, of hypertension and heart disease.

Leslie Bertram Roberts, Brooklyn; New York University College of Medicine, New York, 1938; served an internship at the Jewish Hospital and a residency in the Montefiore Hospital for Chronic Diseases and the Bellevue Hospital in New York; formerly a research fellow in medicine at his alma mater; commissioned a first lieutenant in the medical corps, Army of the United States, on Aug. 21, 1942 and began active duty on Sept. 2, 1942; promoted to captain in June 1943; chief flight surgeon, Army Air Base, Brunswick, Neb.; killed in an airplane accident in Naper, Neb., August 3, aged 28.

Gregory Albert Skully, Detroit; Wayne University College of Medicine, Detroit, 1937; member of the Michigan State Medical Society; interned at the Eloise Hospital, Eloise; commissioned a first lieutenant in the medical corps, Army of the United States, on June 19, 1942 and subsequently promoted to captain; began active duty on July 4, 1942; flight surgeon in the air corps; in charge of the eye, ear, nose and throat division at the Syracuse (N. Y.) Army Air Base Hospital; died in the Station Hospital, Syracuse, N. Y., July 13, aged 32, of pneumonitis complicated by bronchial asthma.

Edwin Theodore Tellman, Palmyra, N. Y.; Rush Medical College, Chicago, 1936; member of the Medical Society of the State of New York; served an internship and residency at the Rochester General Hospital, Rochester; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on Nov. 23, 1936; subsequently promoted to captain and major; died in the Letterman General Hospital, San Francisco, July 16, aged 34, of agranulocytosis with generalized hemorrhage and bronchopneumonia.

Ralph Milton Wyatt • Hiawatha, Kan.; University of Kansas School of Medicine, Kansas City, 1933; served as health officer of Brown County; commissioned a first lieutenant July 21, 1942 and began active duty in the medical corps of the Army of the United States on Aug. 22, 1942; later promoted to captain; flight surgeon; died in an airplane accident in Aldershot, England, June 8, aged 38.

Bureau of Investigation**STIPULATIONS****Agreements Between Federal Trade Commission and Promoters of Various Products**

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Foster's Wonder 30 Minute Corn and Callous Remover.—This is sold by Stomar Products Company, Kansas City, Mo. In November 1943 the concern and its advertising agency stipulated with the Federal Trade Commission to cease representing that the product promotes healing, and disseminating any advertisement which did not warn that care should be taken not to allow the preparation, full strength, to remain too long in contact with the corn, lest its corrosive action extend to the underlying tissue.

H-B Cough Drops.—The C. A. Briggs Company, trading as H. B. Sales Company, Cambridge, Mass., stipulated with the Federal Trade Commission in November 1943 that it would cease describing its cough drops by the term "Hospital Brand," which might give the erroneous impression that the product is made in accordance with a formula prescribed or endorsed by a hospital. Further, it agreed to cease representing that the cough drops contain vitamin A, that their use will impart the benefits derived from the consumption of that vitamin, or that they purify and soften all hardened places in the throat.

Imperial Lax-101.—This is put out by William H. Braun and Alice C. Braun, trading as Imperial Brands Company, Chicago. A stipulation which they entered into with the Federal Trade Commission in December 1943 provided that they would cease representing that the product is a gentle or mild laxative and will move the bowels easily without irritation to the intestinal walls, that it will change an unhealthy evacuation to a healthful one, that it contains no habit-forming drugs, that delayed evacuation will poison the system and lower bodily resistance and that their preparation will remedy such conditions. Further, they agreed to discontinue any advertisement which did not reveal that Imperial Lax-101 should not be used when abdominal pains or other symptoms of appendicitis are present; provided, however, that such advertisements need only contain the statement, "Caution Use Only as Directed" when the labeling carries a warning to the same effect.

Lax-Aid.—Frank M. Spors and Esther Spors, trading as the Spors Company, LeCenter, Minn., who distribute this product, stipulated with the Federal Trade Commission in November 1943 to discontinue any advertisements which did not reveal that the product should not be used when abdominal pain, nausea or other symptoms of appendicitis are present; provided, however, that such advertisements need only contain the statement, "Caution Use Only as Directed" if and when the directions for use, when appearing in the labeling, contain a warning to the same effect.

Mamie's New Discovery Scalp Ointment.—In December 1943 one Mamie Wilson of Los Angeles stipulated with the Federal Trade Commission that she would cease representing that this product will prevent loss of hair or baldness, counteract conditions causing hair loss, or be a cure for dandruff or other scalp ailments except to the extent that it may mitigate itching of the scalp, that it will nourish or stimulate the hair roots or make the hair grow or take on new life, or will tone the oil glands of the scalp or the blood corpuscles, or have any other effect on the latter.

NR Tablets or Nature's Remedy.—The Lewis Howe Company, St. Louis, which sold this product, entered into a stipulation concerning it with the Federal Trade Commission in November 1943. In this the concern agreed to discontinue any advertising which failed to reveal that the preparation should not be used when abdominal pain, nausea or other symptoms of appendicitis are present, provided, however, that it would be sufficient if the advertising made the statement, "Caution Use Only as Directed" if the instructions for use on the label or elsewhere in the labeling should contain a warning to the same effect.

Othine Face Bleach.—This is put out by the Othine Corporation of Buffalo, N. Y. In February 1944 that concern stipulated with the Federal Trade Commission that it would discontinue any advertisement which did not reveal that the product should not be applied at any one time to an area of skin larger than that of the face and neck; that too frequent applications over excessive periods of time should be avoided; that adequate rest periods between series of treatments should be observed, that the bleach should not be used where the skin is cut or broken, and that in all cases a proper patch test should be made to determine whether the user is allergic or sensitive to the preparation. The stipulation provided, however, that it would be sufficient for future advertisement to contain only the statement, "Caution Use Only as Directed" if the instructions for use on the label contain a warning to the same effect.

Correspondence**QUESTIONABLE VALUE OF VITAMIN C FOR HAY FEVER**

To the Editor:—Almost every year, with the approach of the pollen season, the public becomes repeatedly apprised of some new "cure" or remedy for this affliction. Through the medium of newspapers, magazines and radio such an impression is made on people that they ask their physicians for these drugs or, what is worse, use them themselves prior to obtaining a medical opinion. One year ionization of the nose was popular; then phenol cauterization; a few years ago potassium chloride was the rage. Careful observation by allergists subsequently disproved the value of these remedies.

This year it is vitamin C. My associates and I undertook a study of this work, commencing with the tree pollinating season in April 1944 in the New York area. It subsequently included the grass and early part of the ragweed season. Some persons were pure hay fever sufferers, others had pollen asthma. The two sexes were about equally represented. Ages varied from 4 to 73 years. Occupations were diversified. The average adult daily dose was 500 mg. of ascorbic acid given in divided doses for a two week period.

It is important to know that pollen symptoms may change remarkably during the day. A victim may be in much distress and quickly be relieved spontaneously, depending on the pollen content in the air, which is quite variable during the day. In appraising results, it is therefore necessary to utilize a large enough group of cases, observe them particularly through the peak of the pollen seasons, and make comparisons with at least one previous year. This we carried out on 48 patients.

Our preliminary findings absolutely do not warrant the recommendation of vitamin C in pollinosis, either as the sole measure of therapy or in conjunction with the injection treatment. We are making observations on allergies other than pollinosis, as well as noting the effects of vitamin C on the peak of the ragweed season, but its value on tree, grass and early ragweed sufferers is highly questionable. In my opinion, therefore, vitamin C cannot be regarded as a useful form of therapy in pollinosis.

DAVID LOUIS ENGELSHER, M.D., New York.
Chief in Allergy, Bronx Eye and Ear Infirmary,
Morrisania City Hospital and Fordham Hospital.

Medical Examinations and Licensure**COMING EXAMINATIONS AND MEETINGS****BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES**

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Sept. 23, page 258.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. Parts I and II. Various centers, Nov. 13-15. Part III. Various centers, September or October. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY. Written. Part I. Various centers, Jan. 19. Final date for filing application is Oct. 21. Sec., Dr. P. M. Wood, 745 Fifth Ave., New York 22.

AMERICAN BOARD OF INTERNAL MEDICINE. Written. Feb. 19. Final date for filing application is Dec. 15. Asst. Sec., Dr. W. A. Wercell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY. Written. Part I. Various centers, Feb. 3. Sec., Dr. Paul Titus, 1915 Highland Blvd., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY. Los Angeles, January. Final date for filing application is Oct. 1. New York, June. Chicago, October, 1945. Final date for filing application is Dec. 1. Sec., Dr. S. J. H. Beach, 56 Erie Road, Cape Cottage, Maine.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral*. Chicago, Oct. 4-7. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Oral*. New York, April 14-15. Final date for filing application is Dec. 15. Chicago, May 19-20. Final date for filing application is Jan. 19. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY: *Oral*. New York, December. Final date for filing application is Sept. 30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington 6, D. C.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Silicosis Not an "Injury by Accident."—For thirteen years during the winter months Johnson was employed in a rock or stone crushing plant operated in South Dakota by the defendant. Eventually he contracted pneumoconiosis, or silicosis. Later he instituted an act at law against his employer, based on the theory that he had contracted the pulmonary dust disease referred to during the course of his employment because the employer had negligently failed to maintain in its plant an adequate ventilating system or to install exhaust fans and dust chambers or other suitable contrivances for the removal of dust. The employer moved to dismiss the action on the ground that the injury, if any, suffered by the workman was a compensable "injury by accident" under the workmen's compensation act of South Dakota and that consequently any action based on that injury must be instituted under that act and not at common law. The trial court overruled the motion, and the employer appealed to the Supreme Court of South Dakota.

The sole question here involved, said the Supreme Court, is whether or not, under the circumstances, the injury suffered by the workman is an "injury by accident" within the meaning of the workmen's compensation act, which provides that a compensable "injury" or "personal injury" shall mean "only injury by accident arising out of and in the course of the employment, and shall not include a disease of any form except as it shall result from the injury." SDC 64 0102 (4). The complaint filed by the workman describes an injury resulting from repeated inhalations of silica over an extended period of time. In *Frank v. Chicago, M. & St. P. R. Co.*, 49 S. D. 312, 207 N. W. 89, 91, in which a thrombus or clot of blood in the femoral vein was under consideration, in construing the language quoted from SDC 64 0102 (4), supra, this court said "Before he can recover it must appear that some mishap, some untoward and unexpected event, occurred without design; that some accidental injury was suffered, traceable to a definite time, place and cause." In *Mellquist v. Dakota Printing Co.*, 51 S. D. 359, 213 N. W. 947, 949, in which an acute heart attack was under consideration, we said "The requirements of *Frank v. Chicago, M. & St. P. R. Co.*, 49 S. D. 312, 207 N. W. 89, 91, have been met, in that the uncontradicted statements of two physicians show that the injury was of a definite, sudden occurrence, directly traceable to a strain." In *Johnson v. La Bolt Oil Co.*, 62 S. D. 391, 252 N. W. 869, this court receded from the view that the cause of the injury must be some unforeseen and unusual operation, act or condition and held that it is sufficient if the injury itself is unexpected. That we did not, by that decision, recede from the view that the injury must be traceable to a definite time, place and cause is implicit in the language of the decision and is made clear in the subsequent case of *Meyer v. Roettle*, 64 S. D. 36, 264 N. W. 191, 194. The record in that case discloses an injury as a result of ingesting bacillus botulinus. It was there said:

We are of the view that a disease may be an "injury by accident" within the meaning of our statute. The exclusion is of any disease which is not an accidental injury or which does not result from such injury. It is generally recognized that accident as contemplated by the workmen's compensation law is distinguished from so called occupational diseases which are the natural and reasonably to be expected result of workmen following certain occupations for a considerable period of time. On the other hand, if the element of suddenness or precipitancy is present and the disease is not the ordinary or reasonably to be anticipated result

of pursuing an occupation, it may be regarded as an injury by accident and compensable. . . . The inception of the disease under the evidence in the instant case is attributable to the unexpected and undesigned occurrence of the presence of the poisonous toxin and is assignable to a definite time, place and circumstance. In our opinion death was the result of an accidental injury.

Subsequent to these pronouncements the legislature reenacted the quoted section of the workmen's compensation act as a part of the revision of 1939. It is presumed the legislature intended that this language should be likewise construed as we construed it prior to its reenactment.

The employer contended, however, that the interpretations made by the Supreme Court referred to had been overruled by the court in its opinion in *Hanzlik v. Interstate Power Co.*, 67 S. D. 128, 289 N. W. 589. In that case, said the Supreme Court, we held compensable under the workmen's compensation act encephalitis contracted following a period of exhausting work and exposure. Because the particular work and exposure described in the evidence in that case extended over a period of five days, the employer argues that this court has eliminated the factors of "suddenness and precipitancy" as a condition precedent to the compensability of an injury under the compensation act. That we did not so intend is indicated by our language in that case, for there we said:

Viewing the record in the light of the tests announced in *Meyer et al. v. Roettle et al.*, supra, we are of the opinion that findings based upon substantial evidence support the conclusion that claimant's disease constituted an "injury by accident." His collapse came suddenly upon the heels of unusual exertion, exposure and exhaustion as an untoward, unexpected and unanticipated result of pursuing his employment."

The Supreme Court accordingly held that, since the complaint failed to describe an injury attributable to a definite time and cause or circumstance, it did not describe an "injury by accident" within the meaning of the compensation act and that accordingly the trial court was correct in ruling that an action under the common law was properly maintainable. The order of the trial court was accordingly affirmed—*Johnson v. Concrete Materials Co.*, 15 N. W. (2d) 4 (S. D., 1944).

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 8-12. Dr. W. L. Benedict, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Academy of Pediatrics, St. Louis, Nov. 9-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.

American Hospital Association, Cleveland, Oct. 2-6. Mr. George P. Bugbee, 18 East Division St., Chicago, Executive Secretary.

American Public Health Association, New York, Oct. 3-5. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, Executive Secretary.

Annual Conference of State Secretaries and Editors, Chicago, Nov. 17-18. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.

Association of American Medical Colleges, Detroit, Oct. 23-25. Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary.

Association of Military Surgeons of the United States, New York, Nov. 2-4. Col. James M. Phalen, Army Medical Museum, Washington 25, D. C., Secretary.

District of Columbia, Medical Society of the, Washington, Oct. 5-7. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.

Indiana State Medical Association, Indianapolis, Oct. 3-5. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis 4, Executive Secretary.

Inter State Postgraduate Medical Association of North America, Chicago, Oct. 17-20. Dr. Arthur G. Sullivan, 16 N. Carroll St., Madison, Wis., Managing Director.

International College of Surgeons, U. S. Chapter, Philadelphia, Oct. 3-5. Dr. Desiderio Roman, 250 South 17th St., Philadelphia, Secretary.

Kansas City Southwest Clinical Society, Kansas City, Mo., Oct. 2-4. Dr. William M. Korth, 1115 Grand Ave., Kansas City 6, Mo., Secretary.

Midwestern Section of American Federation for Clinical Research, Chicago, Nov. 2. Dr. Richard H. Lyons, University Hospital, Ann Arbor, Mich., Secretary.

Oklahoma City Clinical Society, Oklahoma City, Oct. 23-26. Dr. L. C. McHenry, 512 Medical Arts Bldg., Oklahoma City, Secretary.

Omaha Mid West Clinical Society, Omaha, Nebraska, Oct. 23-27. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha 2, Secretary.

Southern Medical Association, St. Louis, Mo., Nov. 13-16. Mr. C. P. Loran, Empire Building, Birmingham 3, Ala., Secretary.

Virginia, Medical Society of, Richmond, Oct. 23-25. Miss Agnes V. Edwards, 1200 E. Clay St., Richmond 19, Secretary.

by parenteral administration, in a critical series of 16 patients with pulmonary tuberculosis. Cases selected were largely those presenting relatively recent exudative lesions in which the prognosis was poor under any form of treatment. The median average daily dose was 1.07 Gm., and the median length of treatment was five and one-half months. No other treatment except bed rest was employed. The degree and rapidity of improvement during promin therapy, as indicated by x-ray appearances, were greater than would have been anticipated in the same group of cases under rest treatment alone. In certain cases the course of the disease was abruptly reversed from progression to retrogression, but in a few instances the disease remained stationary or progressed during seemingly adequate promin treatment. Promin probably exerts a beneficial effect on human pulmonary tuberculosis when the lesions are of recent origin. Few observations have been made on chronic lesions, but it seems unlikely that they would be appreciably affected by promin. The curative action of promin in human pulmonary tuberculosis is not very potent, and promin alone should not be relied upon to effect an arrest. If these conclusions are borne out by further investigation, promin will have a place in the therapy of pulmonary tuberculosis but strictly as an adjunct to other modes of treatment. The potentially serious toxic effects of promin require that the use of the drug be adequately supervised. They also limit the therapeutic dosage. The high degree of solubility of promin facilitates its parenteral use and therefore appears to give promin a definite therapeutic advantage over relatively insoluble compounds in instances of temporary intolerance to oral medication.

50:1-84 (July) 1944

Comparison of Roentgenograms with Pathology of Experimental Military Pulmonary Tuberculosis in Rabbit. E. M. Medlar, G. S. Pesquera and W. H. Ordway.—p. 1

Patients Discharged Alive from County Sanatorium. D. R. Hastings and B. Behn.—p. 24.

Tuberculoma of Posterior Mediastinum. B. Blades and D. J. Dugan.—p. 41.

*Loeffler's Syndrome. Transient Pulmonary Infiltrations with Blood Eosinophilia. H. B. Pirkle and Julia R. Davin.—p. 48.

*Chemotherapy of Clinical Tuberculosis with Promin. P, P' Diaminodiphenylsulfone-N, N'-Dioxetose Sulfonate, Second Report of Progress. H. C. Hinshaw, K. H. Pfuetze and W. H. Feldman.—p. 52.

Cultivation of Bovine Tubercle Bacillus. A. R. Arena and A. Cetranolo.—p. 58.

Cutaneous Activity of Old Tuberculin Prepared by Same and by Different Methods. R. Y. Gottschall, A. B. Mitchell and C. J. Stringer.—p. 68.

Further Observations on Production of Autolytic Tuberculin. H. J. Corper and M. L. Cohn.—p. 81.

Transient Pulmonary Infiltrations with Blood Eosinophilia.—Loeffler's syndrome, according to Pirkle and Davin, consists of asthma with cough, the occurrence of eosinophilia ranging from 10 to 60 per cent, the presence of a low grade fever accompanied by mild leukocytosis and an elevated sedimentation rate. X-ray examination reveals pulmonary infiltrations in various parts of the lungs, usually in the lower fields. They disappear rapidly and do not cavitate. Loeffler did not stress the possible allergic nature of the condition, but subsequent observers have suggested and sometimes demonstrated that the pulmonary infiltrations are on the basis of an allergy. The authors state that a woman aged 54 presented a history different from some of the other reported cases of Loeffler's syndrome in the absence of asthma and in the long duration of the pneumonic migrations. The pneumonitis continued to migrate for eight months. This woman is now employed as a nurse's aid. She continues to be nervous with easy fatigability and a tendency to tachycardia, but chest x-ray films taken at intervals of two months remain clear and there is no eosinophilia. The etiology of the syndrome remains obscure.

Promin in Tuberculosis.—Hinshaw and his co-workers presented in May 1942 a preliminary report on their experiences with promin (a diaminodiphenylsulfone derivative) with special reference to a group of 36 patients who had received supposedly adequate doses for from four to twelve months. The originally described clinical trends have been consistent and progressive on further observation. The results are sufficiently encouraging to justify controlled studies on a large series. Exudative lesions of recent origin appear to be more promising types for chemotherapy than those with caseation, necrosis, cavitation and

fibrosis. The toxic manifestations of promin and related drugs are to be constantly reckoned with but are measurable, reversible and controllable and do not appear to have an adverse effect on the clinical course of tuberculosis. Anemia of considerable degree does not appear to hinder the healing process in tuberculosis. A few patients of this series made striking and consistent gains during a time when the hemoglobin content of their blood, as a result of chemotherapy, was constantly less than 10 Gm per hundred cubic centimeters. The authors also direct attention to the use of promin in the treatment of human leprosy.

Anesthesiology, New York

5:329-440 (July) 1944

Studies on Barbiturates: XXVII. Tolerance and Cross Tolerance to Barbiturates. M. W. Green and T. Koppányi.—p. 329.

Intraspinal Ammonium Salts for Intractable Pain of Malignancy. B. D. Judovich, W. Bates and K. Bishop.—p. 341.

Spinal Cord Level Syndrome Following Intrathecal Ammonium Sulfate and Procaine Hydrochloride: Case Report with Autopsy Findings. S. A. Guttman and I. Pardee.—p. 347.

Subarachnoid Ammonium Sulfate Therapy for Intractable Pain. L. V. Hand.—p. 354.

Inhalation Therapy: Method for Collection and Analysis of Statistics. M. Saklad, N. Gillespie and E. A. Roenestine.—p. 359.

Clinical Use of [Sodium 5 Ethyl-5 (1-Methyl-1 Butenyl)] Barbiturate]. Vinbarbital Sodium as Preanesthetic Agent. P. H. Lorhan.—p. 370.

Effective Administration of Ether in Tropics. M. P. C. Storni and J. S. Lundy.—p. 380.

Respiratory Sequelae of Anesthesia in Military Practice. G. Kaye.—p. 383.

Nasendotracheal Intubation. Advantages and Technic of "Blind Intubation." C. K. Elder.—p. 392.

Role of Anoxia in Gastrointestinal Effects of Anesthesia. E. J. Van Liere.—p. 400.

Annals of Allergy, Minneapolis

2:189-280 (May-June) 1944

*Allergy of Central Nervous System. T. W. Clarke.—p. 189.

Etiology of Seasonal Hay Fever in District of Columbia. G. T. Brown.—p. 197.

Presence of Thermostable Inhibiting Factor in Serums of Patients Treated for Hay Fever by Injections of Pollen Extract. E. A. Brown and E. M. Holden.—p. 207.

Sympathectomy as Aid in Relief of Familial Nonreaginic Food Allergy: Preliminary Report. A. F. Coca.—p. 213.

Protection of Asthmatic Patient Against Lung Irritants, with Special Reference to Chemical Agents Used in Warfare. K. J. Deissler.—p. 225.

Unusual Case of Sulfathiazole Sensitivity of Renal Type. J. Peters and A. J. Koven.—p. 230.

Importance of Vitamin C in Bodily Defenses: I. Antianaphylactic Effect of Vitamin C in Prevention of Pollen Reactions. L. Felner.—p. 231.

Allergy of Central Nervous System.—Clarke believes that symptoms of increased intracranial pressure such as headache, vomiting, dizziness, pressure on the optic nerve, convulsions, hyperesthesia, anesthesia, paralysis and psychosis may occur as the result of an allergic shock. Many cases of migraine, of Ménière's disease and of infantile convulsions are of allergic origin. In 1922 Ward suggested that epilepsy is a manifestation of allergy. Clark examined a large number of epileptic patients from the point of view of allergy and concluded that in some there was an allergic etiology. Favorable results may be obtained if this is discovered early enough. He cites several examples and suggests that epilepsy is a manifestation of various conditions, one of which is allergy. It is improbable that an allergic study will relieve more than 10 per cent of the patients. The mental effects of allergy have received little study, though nervous symptoms are so common in association with the allergic diseases that until recently asthma, urticaria, angioneurotic edema and migraine were thought to be primarily diseases of the nervous system. It is a matter of common experience that the asthmatic child, though amenable normally, becomes irritable during an asthmatic seizure. Insomnia and excessive somnolence also have been overcome by correcting the diet of allergic patients. Though it has been demonstrated that allergic shock can cause mental depression, bewilderment and even active delirium, the psychiatrist has entirely overlooked the possibility of some of the recurrent types of psychoses having an allergic background. When patients with recurring psychoses give a family or personal history of allergic disease, they should be given a thorough investigation of their allergic idiosyncrasies and the appropriate treatment indicated thereby.

Annals of Surgery, Philadelphia

119:801-968 (June) 1944

- *Physiologic Analysis of Nature and of Treatment of Burns. W. W. L. Glenn.—p. 801.
- *Nutritional Care of Cases of Extensive Burns, with Special Reference to Oral Use of Amino Acids (Amigen) in 3 Cases. Co Tui, A. M. Wright, J. H. Mulholland, I. Barcham and E. S. Breed.—p. 815.
- Adenomatosis of Islet Cells, with Hyperinsulinism. Virginia Kneeland Frantz.—p. 824.
- Pancreaticojejunostomy and Other Problems Associated with Surgical Management of Carcinoma Involving Head of Pancreas: Report of 5 Additional Cases of Radical Pancreaticoduodenectomy. C. G. Child.—p. 845.
- Neurogenic Sarcoma of Jejunum Associated with von Recklinghausen's Disease. J. B. Hamilton, P. C. Kennedy and P. C. Herault.—p. 856.
- Estimation and Significance of Blood Loss During Gastrointestinal Surgery. A. Oppenheim, G. T. Pack, J. C. Abels and C. P. Rhoads.—p. 865.
- Enterogenous Cysts at Ileocecal Junction. S. A. Rosenberg.—p. 873.
- Differential Diagnosis of Causes of Pain in Lower Back Accompanied by Sciatic Pain. P. B. Magnuson.—p. 878.
- Anatomic Study of Lumbosacral Region in Relation to Low Back Pain and Sciatica. W. A. Larmon.—p. 892.
- Chronic Spinal Epidural Granuloma: Report of 2 Cases. M. O. Grossman, B. H. Kesert and H. C. Voris.—p. 897.
- Venography: Its Value in Diagnosis and Management of Venous Disturbances of Lower Extremities. A. Lesser and G. Danelius.—p. 903.
- Pectus Excavatum: Report of 2 Cases Successfully Operated on. R. H. Sweet.—p. 922.
- Brachial Plexus Block Anesthesia: Improved Technic. D. R. Murphey Jr.—p. 935.
- Basal Cell Lesions of Nose, Cheek and Lips. W. B. Davis.—p. 944.
- Effect of Locally Implanted Sulfonamides on Wound Healing. H. A. Zintel.—p. 949.
- Anesthetic Deaths in 54,128 Consecutive Cases. J. C. Trent and Ellen Gaster.—p. 954.

Physiologic Analysis of Nature and Treatment of Burns.—Glenn discusses the use of closed plaster dressings in burns. There is no local harm from this treatment. There were no instances of injured circulation. The prompt return of function of a part immobilized in plaster over prolonged periods has been one of the most gratifying features. The treatment is comfortable. The plaster dressing is easy to apply to burns of the extremity. The slight after-care is one of the chief advantages. Pain or discomfort in an encased extremity occurring twenty-four to thirty-six hours after application of the dressing was relieved by elevation of the part. After minimal cleaning and débridement and without breaking blisters, two layers of sterile gauze are laid over the burned surface extending above the area to be covered by plaster. If fingers are involved they are enclosed separately in the gauze. A thin sheet of roller plaster bandage is then applied to the part without pressure, extending over the end of the extremity and 2 to 4 inches above the burn. In mild burns the encasement is removed in seven to fourteen days. In more severe burns it may be left in place for as long as four weeks.

Nutritional Care in Extensive Burns.—Co Tui and his collaborators deal with the nutritional care of 3 cases of thermal third degree burns of, respectively, 10, 30 and 50 per cent of the body surface. The patients were given high caloric and high nitrogen feedings in the form of dextrimaltose and amigen. The nitrogen balance was followed throughout convalescence and the plasma proteins and body weight were determined periodically. All 3 patients were maintained in an excellent nutritional state. There seemed to be a mathematical relationship between the extent of surface burned and the amount of nitrogen required to maintain nutrition. Transfusions were reduced to a minimum. Preparations such as amigen seem to be better tolerated and utilized than natural protein food and appear to be the solution to the problem of nutritional care of severe cases of protein drain. The development of shock following immediately on the first skin grafting is a phenomenon which may have an important bearing on the safety of this procedure in extensive burns. Theoretically it is to be expected that in patients undergoing severe protein loss with protein synthesis barely keeping up with the loss the opening up of new areas of the skin surface, with resulting increase in exudation and bleeding, would readily lead to the development of shock. If this explanation is correct, patients in this condition should have no skin grafting attempted unless the protein nutrition has been improved and measures for the therapy of shock are at hand.

Archives of Ophthalmology, Chicago

31:453-584 (June) 1944

- Evaluation of Ocular Angiospasm. S. R. Gifford.—p. 453.
- Dickey Operation for Ptosis: Results in 21 Patients and Thirty Lids: F. C. Cordes and U. Frittschi.—p. 461.
- Role of Sarcoidosis and of Brucellosis in Uveitis. A. C. Woods and J. S. Guyton.—p. 469.
- Development of Anterior Peripheral Synechiae in Experimental Acute Glaucoma. M. U. Troncoso.—p. 481.
- Appraisal of Value of Orthoptic Clinic in Private Practice. E. C. Ellett, R. O. Ryehner and J. S. Robinson.—p. 503.
- Drusen of Optic Nerve Simulating Cerebral Tumor.—N. S. Schlezinger, J. Waldman and B. J. Alpers.—p. 509.
- Uveitis Associated with Hodgkin's Disease: Report of Case. S. Kamellin.—p. 517.
- Uveitis; Dysacusia; Alopecia; Poliosis and Vitiligo: Theory as to Cause. E. B. Hague.—p. 520.
- *Autoinoculation of Eyelids with Vaccinia. W. R. Klunzinger.—p. 539.

Autoinoculation of Eyelids with Vaccinia.—Klunzinger reports the case of a boy aged 8 who developed redness and swelling of the lids of both eyes three days after he had been vaccinated on the right arm. Examination a week after vaccination revealed severe redness of both eyes, swelling and induration, with several ulcerations along the margins, and moderate mucopurulent discharge. There was a nontender swelling from eye to ear bilaterally. A tentative diagnosis of vaccinia reaction was made. Irrigations of boric acid were made every hour during the day, together with application of hot compresses for twenty minutes three times a day. Under this treatment there was decided improvement in five days. The patient was discharged, with instructions to use hot compresses three times a day followed by instillation of aqueous solution of metaphen (1:2,500). Sulfadiazine was used for a short time, since the diagnosis was at first questionable. Its use was discontinued after examination of smears revealed no causative organisms, and its effect was probably only to reduce the febrile reaction. Although ocular complications after vaccination are uncommon, the possibility of their occurrence should be remembered. Lesions of the lids and conjunctiva have been found to run a self-limited course, healing in seven to ten days with no sequelae. Corneal involvement, however, requires a much longer period for healing, and visual impairment often results. It is of the utmost importance to prevent corneal involvement.

Archives of Pathology, Chicago

37:351-414 (June) 1944

- Adrenal Medulla in Various Diseases: Histophysiology Study. R. L. Drake, J. S. Hibbard and C. A. Hellwig.—p. 351.
- Encephalitis Complicating Virus Pneumonia: Report of Case with Autopsy. Helen Ingleby.—p. 359.
- Anomalous Pulmonary Veins. C. W. Hughes and P. C. Rumore.—p. 364.
- Primary Neoplasms of Liver. W. N. Warvi.—p. 367.
- Feather Germ Reaction to Urine from Patients with Cancer and Other Conditions: Preliminary Study. Mary Juhn.—p. 383.
- Origins of Cell Concept in Pathology. H. G. Schlumberger.—p. 396.

Archives of Surgery, Chicago

48:423-498 (June) 1944

- *Syphilis of Tendon of Long Head of Biceps Muscle and of Olecranon Bursa. V. L. Schrager.—p. 423.
- Tuberculous Abscess of Thyroid Gland: Report of Case and Review of Literature. R. W. Postlethwait and P. Berg Jr.—p. 429.
- *Role of Allergy in Delayed Healing and Disruption of Wounds: I. Antigenicity of Catgut. H. C. Hopps.—p. 438.
- *Id.: II. Effect of Specific Sensitivity to Catgut on Reaction of Tissues to Catgut Sutures and of Healing of Wounds in Presence of Catgut Sutures. H. C. Hopps.—p. 445.
- *Id.: III. Delayed Healing and Disruption Produced by Local Allergic Reaction (Auer Phenomenon). H. C. Hopps.—p. 450.
- Progressive Gangrene in Operative Wound. D. W. Leonard.—p. 457.
- Regional Enteritis: Pathologic Study of 22 Cases. F. M. Owens Jr.—p. 465.
- Results of Long Term Experimental Constriction of Hepatic Veins in Dogs. C. D. Armstrong and V. Richards.—p. 472.
- Chemosurgical Treatment of Cancer of Lip: Microscopically Controlled Method of Excision. F. E. Mohs.—p. 478.
- Effects of Continuous and of Intermittent Application of Tourniquet to Traumatized Extremity. A. Blalock.—p. 489.
- Effect of Hypoproteinemia on Susceptibility to Shock Resulting from Hemorrhage. I. S. Ravdin, H. G. McNamee, J. H. Kamholz and J. E. Rhoads.—p. 491.

Syphilis of Tendon of Biceps and of Olecranon Bursa.—Schrager's patient, aged 61, gave a long history of pain in different joints which had been diagnosed repeatedly as rheumatism and arthritis. A 4 plus Wassermann reaction years before led to treatment with neoarsphenamine and bismuth compounds

but the treatment was discontinued when jaundice developed. The patient presented a tumor mass in the upper part of the arm. Operation revealed a tumor mass in the tendon sheath of the long head of the biceps muscle. It was removed together with a few strips of tendon and its sheath, which were red and frayed. An olecranon bursa the size of a large walnut was present over the right elbow. It had a thick capsule. The contents of the bursa were exactly like those found in the tendon sheath of the biceps muscle. Both wounds healed by primary intention. Microscopic examination of the tumor mass revealed changes compatible with a syphilitic granuloma, and the olecranon bursa showed a picture characteristic of a syphilitic gumma. Spirochetes were found in the granulation tissue. The author thinks that syphilis of tendons and bursas should be suspected more often in the diagnosis of tendinitis and bursitis.

Antigenicity of Catgut.—Hopps attempted to determine whether or not a state of hypersensitivity to catgut can be induced. It was considered that catgut per se, because of the probable denaturation of protein and the chemical alteration sustained during preparation and because of its relative insolubility, is a poor antigen. Sheep serum or sheep intestine might be more effective in stimulating the formation of antibodies to catgut than catgut itself. For these reasons the following materials were used as antigens: (1) plain surgical catgut, (2) sheep intestine, (3) sheep serum. The author produced hypersensitivity to catgut in rabbits and guinea pigs, as shown by positive cutaneous reactions, positive reactions to catgut implanted in the anterior chamber of the eye and demonstration of humoral antibodies (precipitins, agglutinins, complement fixing antibodies and anaphylactins) in vivo and in vitro. Catgut, sheep intestine or sheep serum is capable of inducing this hypersensitive state. In addition to antibodies which will react with either catgut or sheep serum, catgut stimulates the production of antibodies specific for itself. These antibodies specific for catgut may also be specific for collagen or for mucoprotein. Heterophile antibodies do not react with catgut.

Effect of Sensitivity to Catgut on Reaction of Tissues to Catgut Sutures.—These experiments were designed to evaluate the effects of hypersensitivity to catgut on the reaction of tissues to catgut sutures and on the healing of surgical wounds repaired with catgut. Hopps observed evidence of slightly heightened reaction of the tissues to catgut sutures in animals which were hypersensitive to catgut. There was, however, no appreciable difference between normal rabbits and rabbits sensitized to catgut in the rate of dissolution or digestion of catgut sutures during the critical period of healing of wounds. There was no significant difference between normal rabbits and rabbits sensitized to catgut in the healing of laparotomy wounds repaired with catgut sutures. The absence of significant allergic reaction to catgut in the wounds of animals sensitized to catgut is attributed to the relative insolubility of catgut sutures.

Delayed Healing and Disruption Produced by Local Allergic Reaction.—Hopps directs attention to Auer's phenomenon of "local autoinoculation of the sensitized organism with foreign protein." It is generally accepted that disruption of the wound is more prone to occur when an abdominal operation is performed in the presence of preexisting infection, such as pelvic abscess or peritonitis. Although this increased incidence of breakdown of the wound may be in response to direct infection of the wound, the possibility of yet another mechanism appears. In the presence of a well localized infection the patient may be assumed to have a rather high degree of immunity or sensitivity to the specific infectious agent and a high humoral antibody titer. As the result of operative manipulation of such a localized infectious lesion an appreciable amount of dead or living bacteria and their products may be forced through the protective barrier of granulation tissue to enter the general circulation. Under these conditions all of the necessary requirements for the development of an Auer reaction would be fulfilled: (1) the surgical wound, providing a localizing lesion; (2) the chronic infection, stimulating a high humoral and tissue antibody titer, and (3) manipulation of the localized infectious process, allowing for the introduction of specific antigen into the blood stream. Experiments demonstrated that the healing of laparotomy wounds is profoundly altered in rabbits previ-

ously sensitized in which specific antigen is reinjected post-operatively. The most obvious explanation is that a local anaphylactic reaction plays a predominant part. Other possibilities to be considered are a direct or indirect effect of general anaphylaxis and local formation of antibodies. The author concludes that local allergic reaction at the site of a surgical wound will delay healing and encourage disruption. The mechanism of such delayed healing appears to rest in a failure of the maturation of macrophages, with resultant failure in the production of the reticulum and collagen.

California and Western Medicine, San Francisco

60:273-356 (June) 1944

Aviation Medicine in Peace and War. C. R. Glenn.—p. 278.
Venereal Disease Control in Military Scene. J. R. Scholtz.—p. 283.
Placenta Previa. P. H. Arnot.—p. 287.
Psychoses Following Prosthetic Surgery. A. G. Folte.—p. 289.

61:1-48 (July) 1944 *

Public Relations Survey of California. J. R. Little.—p. 10.
*Carbon Tetrachloride Poisoning: Report of Cases. B. E. Konwaler and C. B. Noyes Jr.—p. 16.
Public Health: Medical Specialty. W. L. Halverson.—p. 21.
Leukemia as Cause of Nasal Obstruction: Report of Case. F. N. Hatch.—p. 23.

Carbon Tetrachloride Poisoning.—Konwaler and Noyes add 3 more cases of poisoning from carbon tetrachloride to those reported by others. The 3 men drank heavily over the weekend and reported for duty Monday morning with "hang overs." They worked from 8:30 a. m. to 11:30 a. m. in a poorly ventilated compartment. Three other men, who had not been drinking liquor recently, were also working in the same compartment. The men were cleaning machinery with rags soaked in carbon tetrachloride. They had volatilized approximately 1½ quarts of the liquid in three hours when they noticed that the smell of the vapor became quite heavy. Only 1 of the men developed symptoms during the period of exposure. One patient, who later died, first felt sick at 10 a. m. The second victim felt well until 6:30 that evening. The third man had left the compartment frequently and had been exposed much less than the first two. He showed no symptoms of poisoning until the following morning. The three nonalcoholic workers developed no symptoms and continued at their duty. The 3 cases illustrate three grades of severity of carbon tetrachloride intoxication. Carbon tetrachloride is a potent renal poison, resulting in severe cases in acute toxic nephrosis with uremia. Hepatitis is also found but is not severe. Alcohol ingestion prior to exposure assumes a synergistic role.

Canadian Medical Association Journal, Montreal

51:1-98 (July) 1944

Problems of Future for Organized Medicine. D. S. Lewis.—p. 1.
Factors Influencing Rate of Flow of Intravenous Infusions. H. E. Pugsley and R. F. Farquharson.—p. 5.
Studies on Increased Coagulability of Blood. T. R. Waugh and D. W. Riddick.—p. 11.
*Simple Office Test for Uterine Cancer Diagnosis. J. E. Ayre.—p. 17.
Generalized Granulomatous Reaction Following Sulfonamide Therapy. W. S. Hartroft.—p. 23.
Drug Eruptions, with Special Reference to Sulfa Drugs. J. F. Burgess.—p. 25.
Thiouracil in Treatment of Thyrotoxicosis. E. M. Watson and L. D. Wilcox.—p. 29.
Thiouracil and Its Effects on Hyperthyroidism. J. K. McGregor.—p. 37.
Thiouracil in Treatment of Hyperthyroidism. Elizabeth M. Martin.—p. 39.
Fractures of Femur in Canadian Army in England. A. D. McLachlin and J. A. MacFarlane.—p. 41.
Incidence of Pulmonary Tuberculosis in Royal Canadian Naval Service. C. B. Peirce, G. Jarry and A. C. Richardson.—p. 46.
Septate Vagina Complicated by Pregnancy. N. H. Olesker.—p. 51.

Simple Office Test for Uterine Cancer Diagnosis.—Ayre points out that in many cases intensive study of several smears is required to arrive at a correct diagnosis when the smears are taken directly from the vagina. He suggests a modification which consists in taking a smear directly from the external os of the cervix. Here the concentration of cancer cells is greater. In Ayre's series of cases, smears from the vagina were compared with smears from the external os, and in both cervical and fundal carcinoma a much greater concentration of cancer cells was consistently present in smears from the cervix. The vaginal smear test for cancer may be con-

sidered a surface biopsy of the cells and cell clumps being shed by the genital tract. The finding of cancer cells in these secretions would appear to be strong presumptive evidence of cancer. The mere finding of the cells does not always point to the origin of the growth. Since malignant growths of the genital tract are chiefly cervical or fundal, these sites should be the first to be subjected to biopsy. Diagnosis of cancer cells in smears should be confirmed by biopsy before operation or radiotherapy. At the author's clinic 40 cases of uterine cancer were proved by biopsy, and of these 38 showed cancer cells in the smear.

Hawaii Medical Journal, Honolulu

3:213-260 (May-June) 1944

*Weil's Disease: Report of 37 Cases. H. M. Patterson.—p. 213.
Bacillary Dysentery, with Special Reference to Epidemic on Maui. W. B. Patterson.—p. 222.

Weil's Disease.—Patterson reports observations on 37 cases treated by him at Olaa Hospital between October 1941 and November 1943. In the Olaa area of Hawaii this disease is essentially an occupational one, occurring principally in young cane cutters. The first symptom in half of the patients was headache. All the patients had loss of appetite and generalized malaise, with 50 per cent having more pain in the calf muscles than elsewhere. Nineteen patients had chills and 13 vomited before admission. All patients had eye symptoms such as conjunctivitis and scleritis, which is the most important manifestation in this disease. All patients were listless and 36 had muscle weakness. Jaundice was present on admission in only 7 patients and developed later in only 9 others. Weight loss averaged 11% pounds. The average peak temperature was 102.8 F. Twenty-nine patients showed albumin in the urine, 18 showed cells of some kind in the urine and only 1 showed casts. Repeated blood serum agglutination tests are the most reliable laboratory procedure. All patients had positive blood serum agglutinations for *Leptospira icterohemorrhagiae* in dilutions of 1:300 or more. The treatment of choice is whole blood transfusions from convalescent patients. Otherwise the treatment is largely symptomatic. Sulfathiazole and sulfadiazine seem ineffective. The medical profession and industry in the territory should cooperate in the development of a vaccine to be used in the immunization of field workers, and possibly the entire population, against Weil's disease.

Journal of Clin. Endocrinology, Springfield, Ill.

4:179-228 (May) 1944

- *Thiourea and Thiouracil in Treatment of Thyrotoxicosis. K. E. Paschkis, A. Cantarow, A. E. Rakoff, A. A. Walkling and W. J. Tourish.—p. 179.
Precocious Sexual and Somatic Development in Male Infant with Pre-Sacral Teratoma Containing Androgen Producing Tissue, with Discussion of Mechanism of Precocity Caused by Teratomas. A. E. Rhoden.—p. 185.
Insulin Requirement of Man After Total Pancreatectomy. M. G. Goldner and D. E. Clark.—p. 194.
Effects of Testosterone and of Testosterone Propionate on Protein Formation in Man. J. C. Abels, N. F. Young and H. C. Taylor Jr.—p. 198.
Excretion of Sodium Pregnanediol Glucuronide in Urine Following Oral Administration of Anhydrohydroxyprogesterone and Progesterone to Patients with Secondary Amenorrhea. W. M. Allen, Ellenmae Viergiver and S. D. Soule.—p. 202.
Optimal Requirements for Adrenal Cortical Hormones as Observed in Adrenalectomized Animals: Brief Review. D. J. Ingle.—p. 208.
Some Recent Advances in Experimental Endocrinology. E. W. Dempsey.—p. 211.

Thiourea in Thyrotoxicosis.—Paschkis and his associates report their experience with the use of thiourea and thiouracil in 21 cases of thyrotoxicosis. They found that thyrotoxicosis can be suppressed with either drug. Thiourea proved to be more toxic and was discontinued as soon as thiouracil became available. Toxic manifestations from thiouracil, consisting of cutaneous eruption, fever, arthralgia, leukopenia and jaundice, were observed in 3 cases. Improvement was usually noticeable after from four to six days of treatment, with complete suppression of thyrotoxic manifestations after two to three weeks. In most cases 1 Gm. of thiouracil was effective, but in 3 instances no response was achieved with 1 Gm. and full effect required 2 Gm. Thiouracil was used for preoperative treatment in 3 cases, the preoperative and postoperative course being satisfactory in 2 and death in thyroid crisis occurring in the third,

in which iodine also had been administered preoperatively. The drug proved particularly valuable in cases in which operation was deemed inadvisable. An attempt was made to establish a permanent maintenance dosage level rather than to employ intermittent treatment. After full effect was achieved, doses as small as 0.1 to 0.2 Gm. daily proved satisfactory. Evidences of myxedema developed in 2 cases and subsided after the drug was temporarily discontinued.

Journal of Nat. Cancer Inst., Washington, D. C.

4:539-600 (June) 1944

- Production of Malignancy in Vitro: VIII: Observations on Mitochondria and Golgi Material. A. J. Dalton and W. R. Earle, with the technical assistance of E. L. Schilling, Virginia B. Peters and Emma Shelton.—p. 539.
Ciliated Cells of Thyroid of Mouse. Thelma B. Dunn.—p. 555.
Growth Rate and Development of Tumors Induced with Ultraviolet Radiation. H. F. Blum.—p. 559.
Review of Serodiagnostic Tests for Cancer. Mary E. Maver.—p. 571.
Influence of Environment on Mammary Cancer in Mice. H. B. Anderson.—p. 579.
Effect of Two Azo Compounds When Added to Diet of Mice. H. B. Anderson, J. White and J. E. Edwards.—p. 583.
Administration of 3,5-Cholestadiene and Dicholesteryl Ether to Mice and Rats. C. D. Larsen and M. K. Barrett.—p. 587.
Test of Desoxycholic Acid for Carcinogenicity in Rats and Mice. M. K. Barrett and C. D. Larsen.—p. 595.

Journal of Nervous and Mental Disease, New York

100:1-114 (July) 1944

- Immediate Circulatory and Respiratory Effects of Convulsive Shock: (Curare Protected Metrazol and Electric Shock). L. F. Woolley.—p. 1.
Central Nervous System in Diphtheria. A. B. Baker and H. H. Noran.—p. 24.
Relationship of Concept Formation Test to Drug Addiction and to Intelligence. C. K. Aldrich.—p. 30.
Unusual Types of Anosognosia and Their Relation to Body Image. N. Roth.—p. 35.
The Absolute and the Unconscious: Freud and America. W. Eliasberg.—p. 44.
Psychiatric Adventure in Comparative Pathophysiology of Infant and Adult, with Some Theoretical Suggestions in Regard to Regression in Somatic Visceral Functions. J. J. Michaels.—p. 49.
Psychomotility in Behavior Disorders as Seen in Handwriting of Children. Selma Schryver.—p. 64.
Prevention of Fatality and Fracture During Electric Coma Therapy. H. F. Darling.—p. 70.

Michigan State Medical Society Journal, Lansing

43:483-526 (June) 1944

- Problem of the Mild Psychoneurotic in Army. W. B. Martin and P. A. Petree.—p. 483.
Postpartum Sterilization. E. A. Schumann.—p. 488.
Edema in Children. I. McQuarrie.—p. 492.
Office Treatment of Rectal Disease. A. E. Souda.—p. 501.

43:527-626 (July) 1944

- Newer Trends in Industrial Sanitation. M. H. Solworth.—p. 558.
Psychiatric Approach to Current Mental Health Problems in Industry. L. E. Himler.—p. 564.
Prevention of Epidemics of Dermatitis in Industry Including Dermato-phytosis. S. M. Peck.—p. 568.
Criteria for Employability of Individuals with Lung Pathology. C. F. Long.—p. 574.
Reconditioning Problems for Disabled Veterans. M. W. Jocz and J. J. Prendergast.—p. 577.
Ocular Pathology Due to Organic Compounds. M. H. Pike.—p. 581.
Penicillin in Surgery. J. W. Hirshfeld.—p. 584.

Northwest Medicine, Seattle

43:185-218 (July) 1944

- Penicillin and Its Therapeutic Uses. F. B. Queen.—p. 188.
Varicose Veins of Lower Extremity. M. S. Rosenblatt.—p. 195.
Parathyroid Extract in Preeclamptic Toxemia. J. C. Brougher.—p. 198.
Staphylococci Septicemia Following Uncomplicated Upper Respiratory Infection: Reported Case with Recovery. M. Scarf, S. Rosenthal and H. H. Marquis.—p. 201.
*Ménier's Syndrome, with Results of Treatment with Histamine. S. E. C. Turvey.—p. 203.

Histamine for Ménier's Syndrome.—Turvey reviews the results of treatment with histamine in 36 cases of Ménier's disease. Four of the patients had meningovascular neurosyphilis and received no other treatment except malaria and chemotherapy. They made an excellent recovery. Sixteen have been treated by histamine intravenously with subsequent subcutaneous injections of histamine, phenobarbital orally and occasionally ammonium chloride. Of these 6 have had no attacks of vertigo

for periods varying from one to three years, 5 are improved and 5 are unimproved. Of the remaining 16 patients who were treated with the Furstenburg regimen, consisting of a low sodium chloride diet and ammonium or potassium chloride orally as well as phenobarbital, 3 have been cured for periods varying from one to five years, 4 are improved and 9 are unimproved. Histamine is not a specific and is only a useful adjunct in therapy which frequently fails. Surgery should always be a last resort to be delayed as long as possible.

Union Médicale du Canada, Montreal

73:617-752 (June) 1944

Tumors of Fourth Ventricle or of Median Line. R. Amyot.—p. 621.
Disturbances During Intermenstrual Period. F. B. Kozlowski.—p. 631.
*Pathologic Relations of Beriberi and Poliomyelitis. W. J. McCormick.—p. 638.

Importance of Direct Test in Determination of Compatibility of Blood in Transfusion. A. Bertrand.—p. 646.

*Paroxysmal Tachycardia of 350 Pulsations per Minute in Nursling. N. Vezina.—p. 648.

Lymphangioma of Mesentery. E. Cabana and L. Mainville.—p. 655.

Solitary Diverticulum of Cecum. G. D'Argencourt.—p. 660.

Hemophylia and Articular Manifestations. L. Morrisette.—p. 662.

Pyridoxine (Vitamin B₆) and Radiation Sickness. J. E. Gendreau and L. Lafleur.—p. 666.

Epidemic Pemphigus of the Newborn: Prophylaxis and Treatment. H. Smith.—p. 671.

Relationship of Beriberi and Poliomyelitis.—McCormick made comparisons between beriberi and poliomyelitis during the Toronto poliomyelitis epidemic of 1937 and has arrived at the hypothesis that poliomyelitis can depend largely on a B avitaminosis. The modern conception of the virus of poliomyelitis, which makes of it a chemical substance of known molecular size rather than a living organism, demands a revision of the interpretation of the experiences of Flexner regarding the specificity and transmissibility of the disease. It would then be necessary to envisage the possibility of the endogenic origin of the virus. The paralysis of poliomyelitis could depend directly on a severe deficiency in vitamin B₁, which in turn would depend on certain factors of activation of the general metabolism and the augmentation of the organism's need for the vitamin. These factors will include febrile conditions, age, sex, atmospheric conditions and physical overexertion at play, work or pregnancy. Thus, poliomyelitis becomes a clinical form of avitaminosis rather than a specific autonomic disease. The virus becomes a biochemical product of the pathologic process itself and, although it may be capable by catalytic action on the nervous system to reproduce paralysis in the laboratory animal, it must not inevitably be considered as a transmitting agent of the disease in ordinary circumstances. It is possible that a substance identical with the virus can be obtained from the nervous system of patients with beriberi. The term poliomyelopathy expresses the nature of the disease better than poliomyelitis.

Paroxysmal Tachycardia in Infant.—Vezina describes 3 successive attacks of paroxysmal tachycardia in an infant. The first attack occurred when the infant was 6 weeks old after having been in his perambulator for three hours under a hot July sun. When taken from his perambulator the child was extremely pale and had a rapid respiration. Heat stroke was thought of, but when severe symptoms persisted the child was hospitalized and a diagnosis of paroxysmal tachycardia was made and medication with digitalin was begun at once. At the end of fourteen days the child was discharged from the hospital apparently entirely well. About two months later the child was hospitalized again. At this time the heart action was so rapid that the beats could not be counted on auscultation. Electrocardiography revealed a sinus tachycardia of from 330 to 350 beats a minute. At the age of 7 months the child had a third attack. During the second and third attacks digitalin was given again, but, while the fortunate development during the first attack must be attributed to oral medication with digitalin, this effect of digitalin was less evident during the second and third attacks. It was impossible to determine the cause of this paroxysmal tachycardia. It is characterized by the sudden appearance of polypnea accompanied by cyanosis. Hepatomegaly is pathognomonic. The author is convinced that paroxysmal tachycardia will be discovered more often in infants if electrocardiography is used more often in pediatrics.

Yale Journal of Biology and Medicine, New Haven

16:395-612 (May) 1944. Partial Index

Comments on Immunity to Virus Diseases. T. Francis Jr.—p. 401.
Use of Immune Bodies in Treatment of Certain Infectious Diseases (Virus and Rickettsial Diseases) Caused by Intracellular Parasites. J. Stokes Jr.—p. 415.

Protective or Curative Element in Type B Haemophilus Influenzae Rabbit Serum. H. E. Alexander, M. Heidelberger and Grace Leidy.—p. 425.

*Use of Sulfaguanidine for Prophylaxis in Sonne Bacillary Dysentery, and in Control of Carrier State. H. Yannet, Joyce V. Deutsch and Rose Lieberman.—p. 443.

*Presence of Poliomyelitis Virus in Human Cases and Carriers During Winter. R. Ward and A. B. Sabin.—p. 451.

Susceptibility of East African Monkeys to Experimental Poliomyelitis. J. R. Paul.—p. 461.

Observations Concerning Pathogenesis and Epidemiology of Mouse Poliomyelitis. S. Gard.—p. 467.

Vitamin B₁ Deficient Animals and Poliomyelitis. J. A. Toomey, W. O. Frohning and W. S. Takacs.—p. 477.

Rocky Mountain Spotted Fever in Children. J. V. Cooke.—p. 495.

Cardiac Hypertrophy in Newborn Infants. H. C. Miller.—p. 509.

Note on Agglutination of Meningococcus. C. P. Miller.—p. 519.

Filariasis Among American Troops in South Pacific Island Group. R. W. Huntington Jr., R. H. Fogel, S. Eichold and J. G. Dickson.—p. 529.

Relation of Insulin to Phosphate Metabolism. W. C. Stadie.—p. 539.

Renal Disease Consequent on Intravenous Injection of Low Viscosity Methyl Cellulose. R. Katzenstein, M. C. Winternitz and J. Meneely.—p. 571.

Congenital Adrenal Cortical Insufficiency with Virilism: Case Report. D. C. Darrow.—p. 579.

Fatal Case of Rat Bite Fever Due to Streptobacillus Moniliformis. F. G. Blake, Dorothy M. Horstmann and Hildegard Arnold.—p. 589.

Eczema and Hemolytic Streptococcal Disease in Children. P. L. Boisvert and G. F. Powers.—p. 595.

Sulfaguanidine for Prophylaxis of Sonne Dysentery.—Yannet and his collaborators showed the effectiveness of sulfathiazole in a previous outbreak of Sonne dysentery in a home for mental defectives. However, the sulfonamide did not curtail the period during which the organism could be recovered by rectal culture. On the contrary, there was evidence that this period was prolonged when compared with untreated controls. It was hoped that the administration of a poorly absorbed drug, such as sulfaguanidine, might correct this defect. A renewed outbreak of Sonne dysentery two years later (1943) gave the authors an opportunity to test the value of sulfaguanidine for reducing the length of the carrier state. The cases of bacillary dysentery were confined to four cottages housing from 40 to 70 inmates each. A total of 29 cases occurred, representing from 10 to 20 per cent of the inmates of the respective cottages involved. The Sonne organism was isolated in every case of acute dysentery. The 29 cases were divided into two groups, one consisting of 18 cases in which sulfaguanidine was administered for seven days; in the remaining 11 cases, the drug was administered for fourteen days. The number of days before the first of the consistently negative cultures was obtained is not significantly different from that in the group in which no specific drug therapy was given. It is felt that the dose used, roughly one fourth of that recommended for therapeutic purposes, might have been inadequate. In two of the cottages it was possible to carry out controlled experiments on the possible prevention of bacillary dysentery by means of sulfaguanidine.

Presence of Poliomyelitis Virus During Winter.—Ward and Sabin report the recovery of poliomyelitis virus in January and February 1942 from the intestinal discharges of 2 poliomyelitis patients, 1 paralytic and the other nonparalytic, and from those of a healthy sibling of each patient who lived on the outskirts of Cincinnati. This isolation of the virus in the winter establishes the occurrence of the disease at that season. This finding has been confirmed by the recovery of virus in February 1942 from the stool of a paralytic patient in Bridgeport, Conn. The epidemiologic implications which suggest themselves are that: 1. Poliomyelitis may occur throughout the year, but its greater incidence during the summer and fall months may be related to opportunities for wider dissemination of virus. 2. It would seem possible that poliomyelitis, like typhoid and dysentery, may be transmitted by any of the several methods whereby infective particles derived from human excrement find their way to the susceptible human host. 3. The patient and the healthy carrier may constitute reservoirs of virus during interepidemic months.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:739-136 (June 3) 1944

Some Problems of Infective Hepatitis. L. J. Witts.—p. 739.
With Eighth Army in Field. C. Donald.—p. 743.

*Some Dangers of Sulfonamides in Ear Infections. A. R. Dingley.—p. 747.
Bone Marrow Transfusion in Infants and Children: Introducing a Specially Designed Needle. Janet D. Gimson.—p. 748.
"Cellophane" for Treatment of Burns. J. Farr.—p. 749.
Symptomless Enlargement of Esophagus. J. L. D'Silva.—p. 751.

Dangers of Sulfonamides in Ear Infections.—Dingley advances the following suggestions for guidance in treatment of otitic infections: Sulfonamides will never take the place of necessary surgical drainage. Treatment of acute suppurative otitis media by a sulfonamide should be reserved for the period after incision of the membrane and bacteriologic investigation. If the fever is maintained, the appropriate sulfonamide may be used in full dosage (day and night) but not after the end of the second week. After two, three or four weeks the condition of the ear, if still actively suppurating, is again becoming one that potentially requires surgical drainage, this time of the mastoid; and signs and symptoms justifying intervention must not be masked by the administration of sulfonamides, which at best will rarely reach the local area but will distort the clinical picture as a whole. Wholesale use of sulfonamides in otitic infections is to be deprecated. If a sulfonamide has been given before drainage, the most valuable help in assessing the beneficial effect of the drug is gained by examining the drum head frequently. If this continues to bulge, myringotomy should not be delayed; for the condition, which otherwise appears to be improving, is in reality becoming more perilous. Persistence of deafness is also a strong indication that all is not well. Patients taking sulfonamide drugs sometimes do not acquire any resistance of their own to the infection with which they are contending, and it would seem that recurrences are more likely in these cases, which, in addition to developing no immunity to the infection, may find that the micro-organism has become sulfonamide resistant. It is needless to emphasize the uselessness and danger of giving inadequate or erratic dosage of sulfonamides.

"Cellophane" for Treatment of Burns.—Farr directs attention to the "cleansing, rest and compression" treatment of burns advocated by Allen and Koch and by Siler. He describes a modification of this method, which consists in an occlusive dressing medicated with sulfanilamide through which the burned area may be easily inspected. This is achieved by the use of "cellophane" and sulfanilamide ointment. Using general anesthesia, the intact skin surrounding the burned area is thoroughly cleaned with white soap and water, and then the toilet of the burned area is carried out with isotonic solution of sodium chloride. The medicated sheets of cellophane are then applied so that each overlaps the other for about an inch. These sheets adhere to one another and to the intact skin, and the entire burn is embraced in an envelop that permits of easy inspection and prevents contamination. Next, perforated oiled silk is wrapped around the cellophane to prevent the wool from adhering to the dressing. After forty-eight hours the burn is inspected. The cellophane may be blistered by collections of serum. Any such bullae are trimmed away with scissors and the area affected gently cleaned with saline swabs and another sheet of cellophane applied. This transparent dressing adheres lightly to healed burned areas but if carefully removed does not damage the delicate new epithelium. The cellophane does not adhere to the unhealed areas, so that damage to the tissue, if the dressing must be changed, is minimal. The cellophane sheets may be medicated, sterilized, and stored for immediate use when needed. It is suggested that the application of a powdered sulfonamide to the burn or wound, followed by the immediate application of cellophane sterilized by boiling, offers many advantages as a first aid measure. It permits of easy

and painless inspection of the burn when the ultimate treatment has to be decided and does not prejudice the form of treatment to be adopted. It would prevent contamination and be bacteriostatic to infection already present in the burn.

Journal of Laryngology and Otology, London

58:465-502 (Dec.) 1943

Acute Otitic Barotrauma—Clinical Findings, Mechanism and Relationship to Pathologic Changes Produced Experimentally in Middle Ears of Cats by Variations of Pressure. E. D. D. Dickson, J. E. G. McGibbon and A. C. P. Campbell.—p. 465.
*Radon Treatment for Otitis Due to Barotrauma (Preliminary Report). E. P. Fowler Jr.—p. 489.

Radon Treatment for Otitis Due to Barotrauma.—Fowler says that at a U. S. Army general hospital in England attempts have been made to treat and prevent otitis due to barotrauma with radon. It was apparent that the men most susceptible to recurrent otitis media were those with large bands of lymphoid hyperplasia in their lateral pharyngeal walls. When these were present in aviators it seemed to predispose particularly to so-called aero-otitis, with high altitude flying or with dive bombing. Earlier, in his practice in New York the author had used two 25 mg. capsules of radium to shrink down excessive lymphoid tissue about the eustachian tubes of children, using the same dosage recommended by Crowe and his associates, who used radon for the same purpose. Radon was obtained in England and 150 millicuries was placed in two capsules and inserted along the floor of the nose and left in place for twenty-six minutes the first day. This gave a dosage of 66 milligram hours to the entire nasopharynx, a dosage equivalent to the 2 Gm. minutes recommended by Crowe. If the patient had a cold 33 milligram hours was given, and if there was no reaction in two or three days the remaining 33 milligram hours was applied. In the past year 127 men of the air force and the ground force have been given treatment of 66 mg. hours, repeated every three to six weeks up to four or more treatments. There is rarely improvement before the third treatment if 66 mg. hours has been used. The dramatic effect on fliers was not surprising, for it is well known that lymphoid tissue is highly susceptible to radiation and most of the fliers had only a small amount to shrink away. This small amount apparently is enough to clog their eustachian tubes if they fly high or change altitude rapidly. Once they are unable to clear their tubes while descending, edema develops in the middle ear with more or less fluid and they may be grounded from two days to several weeks with aero-otitis. The radon apparently facilitates the normal function of the tube if lymphoid hyperplasia has interfered with their proper opening and closing. It puts previously grounded airmen back in the air, even when they have had repeated severe otitis from barotrauma.

Medicina, Madrid

12:227-290 (April) 1944. Partial Index

*Primary Cancer of Liver. M. Valdés Ruiz, A. Zamanillo and E. Salar Luis.—p. 227.

Primary Cancer of Liver.—According to Valdés Ruiz and his collaborators the frequency of primary cancer of the liver without cirrhosis, as reported in the literature, is 1 in 1,000. The symptoms are those of constant epigastric pain which radiates to the right shoulder, loss of appetite, nausea, vomiting, insomnia, headache and acute progressive emaciation. There are progressive uniform enlargement and hardening of the liver, ascites and in rare cases enlargement of the spleen. Primary cancer of the liver without cirrhosis can be differentiated from either primary cancer of a cirrhotic liver or secondary hepatic cancer by the rapid enlargement of the liver, its firmness, a smooth hard border on palpation, moderate ascites and the acute course of the disease, which varies between four and five months after the onset of the symptoms. Cancer hepatoma as found at necropsy is either massive or nodular. The histologic preparations of the liver in cases of nodular cancer show infiltration of the liver parenchyma by cords of cancer cells. Morphologic changes of the liver cells, mitosis and a large number of atypical cells and large cancer cells are observed.

Book Notices

Hydronephrosis and Pyelitis (Pyelonephritis) of Pregnancy: Etiology and Pathogenesis. An Historical Review. By H. E. Robertson, M.D., Section on Pathologic Anatomy, Mayo Clinic, Rochester, Minnesota. Cloth. Price, \$4.50. Pp. 332, with 11 illustrations. Philadelphia & London: W. B. Saunders Company, 1944.

This historical review of hydronephrosis and pyelonephritis of pregnancy is a rare book. The author, a pathologist at the Mayo Clinic, became interested in the subject when many years ago he began to observe at postmortem examinations of pregnant women that the ureters and renal pelvis were dilated. As a result of this interest he read and thoroughly analyzed practically every article and book written on the disturbances of the urinary tract in pregnancy. Throughout the text and the numerous pithy footnotes, there is abundant evidence that the author took nothing for granted. He delved into all the original source material published and gives the impression of having read almost every word of the 974 references which are listed in the back of the book. The author points out errors made even by recognized authorities. He shows how often erroneous statements have been reproduced by writer after writer who did not take the trouble to check the original quotations or references.

The only unfavorable criticism offered is that the author should have devoted more space to the subject of treatment. In reality there is only one paragraph, a *third of a page* long, at the end of the conclusions of the book. Perhaps it is because the author is a pathologist that he refrained from doing this, but he accomplished his task of discussing dilatation and infection of the ureters in pregnancy so admirably that he would have handled the treatment just as satisfactorily.

In the brief but excellent conclusions the author summarizes all the important knowledge we possess about the etiology, anatomy, pathology and bacteriology of hydronephrosis and pyelonephritis of pregnancy.

This is one of the most discerning books, and if any physician, be he obstetrician, urologist, pathologist or general practitioner, wants a real treat, he should read it all the way through. The author is to be highly complimented on his achievement, which represents an enormous amount of hard work. The publishers also have done their part beautifully.

The Dental Treatment of Maxillo-Facial Injuries with Supplementary Material on Cases and Techniques. By W. Kelsey Fry, M.C., M.R.C.S., L.R.C.P., Consulting Dental Surgeon to the Royal Air Force, P. Rae Shepherd, L.D.S., R.C.S., Dental Surgeon, East Grinstead Maxillo-Facial Unit, Alan C. McLeod, D.D.S., B.Sc., L.D.S., Dental Surgeon, East Grinstead Maxillo-Facial Unit, and Gilbert J. Parfitt, M.R.C.S., L.R.C.P., L.D.S., Dental Surgeon, East Grinstead Maxillo-Facial Unit. With foreword by Professor F. R. Fraser, M.D., F.R.C.P., Director General, Emergency Medical Service, and a section on Fractures of the Middle Third of the Face by A. H. McIndoe, M.Sc., F.R.C.S., F.A.C.S., Consulting Plastic Surgeon to the Royal Air Force, Surgeon-in-Charge, East Grinstead Maxillo-Facial Unit. Fabrikoid. Price, \$6.50. Pp. 434, with illustrations. Philadelphia & Montreal: J. B. Lippincott Company, 1944.

During this war the English have had extensive opportunities for the study and treatment of maxillofacial injuries. The employment of common sense with basic principles is noted throughout the book, together with the fact that a wounded patient is being treated rather than an injury with a patient attached to it. Although the chapter on anatomy is much too brief, the excellent description of the muscle pull and its relation to the type of fracture compensates in some degree. The chapter on radiology fills in some measure the need for roentgenology of the facial bones. It is most practical and replete with plates and diagrams. The section on pathology is a welcome addition in a treatise on maxillofacial injuries. Both students and specialists could well profit by reading and rereading it. The authors belong to the school that advocates removal of teeth in line of fracture. An opposite school holds that such teeth should be removed only when there is an indication of trouble, that the tooth should be retained for better approximation of the bone fragments.

Much emphasis is placed on the cast cap splint for fractures of the mandible. This method seems to find greater favor

among our English colleagues, whereas the Gilmer method of wiring (or one of its modifications) is more extensively used in the United States.

The chapter on technic of impression taking and construction of splints is very detailed and most explicit.

The section on field and preliminary hospital treatment of battle casualties can be read with advantage by all medical men engaged in front line action. It is practical and contains much good common sense.

Physiology is stressed throughout the book in connection with treatment.

The supplement with case studies is explicit and instructive, not only for war injuries, but also for maxillofacial injuries occurring among the civilian population during peacetime. The book is profusely illustrated with excellent diagrams and photographs. The reproductions of the roentgenograms are, however, not as clear as they might be.

Artificial Pneumothorax in Pulmonary Tuberculosis Including Its Relationship to the Broader Aspects of Collapse Therapy. By T. N. Rafferty, M.D. Introduction by Henry Stuart Willis, M.A., M.B., Superintendent and Medical Director William H. Maybury Sanatorium, Northville, Michigan. Cloth. Price, \$4. Pp. 192, with 26 illustrations. New York: Grune & Stratton, 1944.

This book provides a discussion of collapse therapy of pulmonary tuberculosis, with special reference to artificial pneumothorax. The author believes that the old practice of attempting artificial pneumothorax in every case before considering surgery, particularly thoracoplasty, should be abandoned and that persons whose disease is so extensive as to require permanent collapse, those with serious pleural infections and those with bronchial tuberculosis should have extrapleural thoracoplasty performed as the primary procedure.

The author believes there is general agreement on the indications for artificial pneumothorax under the following conditions: (1) patients with disease which continues to progress in spite of the usual care; (2) those with cavities and tubercle bacilli in the sputum which do not come under control promptly by bed rest; (3) extensive disease with cavity which could not be expected to be brought under control by the so-called more conservative methods; (4) those with predominantly exudative disease that does not regress after a liberal period of bed rest or bed rest and phrenic paralysis.

Contraindications to artificial pneumothorax which the author considers permanent are (1) a large apical cavity, (2) extensive destruction, (3) the fibrous or shrunken lung and (4) broncho-stenosis. Contraindications which may be temporary or permanent are (1) active bronchial tuberculosis without pronounced stenosis, (2) tuberculous pneumonia and (3) primary tuberculosis. Tuberculous complications, such as laryngitis and enteritis, do not contraindicate artificial pneumothorax except when they are terminal manifestations. Compensated heart disease is not a contraindication unless the tuberculosis is extensive and bilateral. The author wisely points out that in cases of complication the decision concerning pneumothorax can be made only at the bedside.

A liberal point of view is taken on the future possibilities of ambulatory artificial pneumothorax. For example, when all the citizens of the nation are examined and those are found who have recently developed minimal or moderately advanced tuberculosis, so many would need treatment that it would be economically unsound to provide sufficient bed capacity for them. Moreover, if this capacity should be provided it would not long be needed if the intensive program of finding cases was continued. Ambulatory pneumothorax would aid substantially in solving this problem.

In this connection one wonders why the author completely omitted the tuberculin test and emphasized the use of mass radiography in case finding. The tuberculin test is a far better criterion of the tuberculosis situation in any community than the x-ray film. Probably this omission is because he assumes that any physician would have definitely established a diagnosis of tuberculosis before instituting collapse therapy in any form. Unfortunately, many persons are having artificial pneumothorax instituted with diagnoses made on the basis of x-ray shadows and in the total absence of our only two specific findings in

tuberculosis, namely the tuberculin reaction and the recovery of tubercle bacilli.

The pros and cons of instituting artificial pneumothorax in all cases of minimal tuberculosis are discussed. Various other surgical procedures are discussed, such as external drainage of pulmonary cavities, lobectomy and pneumonectomy.

The book contains 195 references and a good index. The author is to be congratulated on having brought together so much valuable information and treating it so adequately and fairly in such small space. This book should be read by all physicians and studied carefully by those who treat chest diseases.

Young Offenders: An Enquiry into Juvenile Delinquency. By A. M. Carr-Saunders, Hermann Mannheim and E. C. Rhodes. Cloth. Price, \$1.75. Pp. 168. New York: Macmillan Company; Cambridge: University Press, 1944.

This short book reports a survey beginning in 1938 and extending for a year, intended to disclose causes of crime in England as elicited by statistical means. There is a survey of previous studies, and the present analysis is made not only in London but in outlying communities, and a control group is added which is an unusual feature in statistical studies of delinquency. While there are many objections to the way the control group was selected, for each delinquent was matched with a boy of the same age who was not a delinquent from the same community, nevertheless the present study is unique and notes more strongly the influence of social factors emphasizing the beliefs that experts on delinquency have had for some years; for example, the importance of broken homes, the meaning of the presence of other delinquents in the family and the significance of leisure-time interests. There is no attempt to make a psychologic breakdown of the cases included, analyzing such factors as motives, mechanisms and diverse therapeutic procedures which in the United States are superseding this statistical approach to a great extent. Nevertheless the work has been soundly done and, while it has no bearing on delinquency in wartime, nevertheless it will probably form one of the statistical bricks in the edifice of delinquency prevention.

Fertility in Men: A Clinical Study of the Causes, Diagnosis, and Treatment of Impaired Fertility in Men. By Robert Sherman Hotchkiss, B.S., M.D., Lieutenant Commander (MC), U.S.N.R. With a foreword by Nicholson J. Eastman, M.D., Chairman, Editorial Committee, National Committee on Maternal Health. Fabrikoid. Price, \$3.50. Pp. 216, with 95 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

Fertility in Women: Causes, Diagnosis and Treatment of Impaired Fertility. By Samuel L. Sieglar, M.D., F.A.C.S., Attending Obstetrician and Gynecologist, Brooklyn Women's Hospital. With a foreword by Robert Latou Dickinson, M.D. Fabrikoid. Price, \$4.50. Pp. 450, with 194 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

These companion volumes have been produced under the stimulus of a series of fortunate circumstances centering in the study of the fertility mechanism by a group of medical scientists and clinicians in New York City. The National Committee on Maternal Health and some of its officers share considerable responsibility with the two authors. The latter are men who have devoted much time to investigations in the fields about which they write, and consequently their evaluation of the work of other men is critical and also comprehensive. The books are well written, easy to read, liberally illustrated and thoroughly documented. The history of the subject occupies little space because of the relatively recent intensive and scientific studies of these fields. From the clinician's point of view these volumes will be helpful because they combine understanding of anatomy, physiology, pathology, bacteriology, endocrinology and clinical skill with therapy. They are not textbooks for beginners but will be unusually valuable handbooks for any clinician who expects to give thoughtful attention to the problems of fertility in either sex. Both authors stress the point that fertility must be considered as a bisexual problem and to a certain extent both partners of every marriage investigated before detailed studies of either one are attempted. Clinical and laboratory techniques described are presented with adequate details, so that any well trained clinician can use them without further laboratory guides or details.

The Principles and Practice of Ophthalmic Surgery. By Edmund B. Spaeth, M.D., Professor of Ophthalmology in the Graduate School of Medicine of the University of Pennsylvania, Philadelphia. Third edition. Cloth. Price, \$11. Pp. 934, with 562 illustrations. Philadelphia: Lea & Febiger, 1944.

The second edition of this excellent treatise on ophthalmic surgery was reviewed in these columns three years ago come November. The third edition, appearing after such a short time, reveals not so much the advances in surgery of the eye as it does the popular demand for a book of this caliber. It contains only 48 more pages than does its predecessor, but it has 105 valuable new illustrations. The most pronounced textual changes deal with the physiology of squint and with the development of nonsurgical principles associated with its correction. This is sound common sense writing, and the material is presented in a most understandable manner. The subject of ptosis has been revamped and reclassified, thus simplifying the principles of its surgical correction. The newest material in this edition is that dealing with gonioscopy, both preoperative and postoperative, with copious quotations from Kronfeld and Barkan. The chapter on the surgical treatment of detachment of the retina should be rewritten, eliminating some of the older operations that have been abandoned, such as the Guist, and elaborating somewhat more on the present day methods. A good working bibliography adds much to the usability of the book, which should be found on the work table of every operating ophthalmologist.

Hackh's Chemical Dictionary [American and British Usage] Containing the Words Generally Used in Chemistry, and Many of the Terms Used in the Related Sciences of Physics, Astrophysics, Mineralogy, Pharmacy, Agriculture, Biology, Medicine, Engineering, etc. Based on Recent Chemical Literature with Numerous Tables, Diagrams, Portraits and Other Illustrations. Third edition, by Julius Grant, M.Sc., Ph.D., F.R.I.C. Fabrikoid. Price, \$12. Pp. 925, with illustrations. Philadelphia: Blakiston Company, 1944.

This chemical dictionary needs no introduction to chemists and those interested in allied subjects. Now in its third edition, the book should continue to serve as a good reference source for explanation of words frequently used in chemistry and other terms often found in physics, astrophysics, mineralogy, pharmacy, agriculture, biology, medicine, engineering and other sciences. More than fifty-seven thousand terms are defined. Theories, laws and rules, elements, compounds, drugs, minerals, apparatus, instruments and names of investigators are only part of the subject matter. In these days it is almost imperative for progressive physicians to be familiar with chemical terms; the present book will provide much help on this score when placed in the medical library. Unfortunately, some of the medical definitions, including those for digitalis, penicillin, calgon, pineal gland and phenobarbital, are not so clear or accurate as they might be, although this failing could be corrected in the next edition with the aid of a physician scientist.

Introduction to Physiological and Pathological Chemistry with Laboratory Experiments. By L. Earle Arnow, Ph.D., B.S., M.D., Director of Biochemical Research, Medical Research Division, Sharp & Dohme, Inc., Glenolden, Pennsylvania. With an Introduction by Katharine J. Densford, B.A., M.A., R.N., Director of the School of Nursing and Professor of Nursing, University of Minnesota, Minneapolis. Second edition. Cloth. Price, \$3.75. Pp. 574, with 144 illustrations. St. Louis: C. V. Mosby Company, 1943.

The second edition of this practical and well written book for nurses on physiologic and pathologic chemistry has been carefully revised. Newer data on sulfonamides, vitamins, the rennin mechanism of hypertension, hormones, muscle carbohydrate metabolism and other advances have been included. The first edition of the book was a contribution to nursing education in this field, and this edition ably perpetuates that distinction. Those who are not familiar with this textbook will find it one of the most effectively written volumes of its type. It is simply and authoritatively written and meets the current suggestions for teaching in this field by those interested in nursing education. Not only is the prevailing thought on biochemistry and physiology concisely presented, but the author's style is engaging. Those interested in nursing education will find this work authoritative and readable. It is highly recommended for nurses in training and for those who wish to keep abreast of current advances in physiology and chemistry.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

CLIMATE IN ASTHMA

To the Editor:—The family of a 5 year old boy who is afflicted with an intractable case of chronic bronchitis and bronchial asthma has consulted me with a view to settling in one of the following localities for purposes of effecting a possible cure: El Paso, Texas; Reno, Nev.; Tucson, Ariz., and southern California. The youngster is allergic to house dust, dog and horse emanations, grass, plantain, ragweed, certain chemical compounds, as varnish, paint and lacquers, gasoline, kerosene, mustard, flaxseed, furnaces and gas stoves, and damp and musty places. Judging from available graphs relative to comparative climate, humidity and general atmospheric conditions, which of the cities mentioned (kindly cite a suitable southern California community of average size population) would prove most beneficial? Which other localities not mentioned might be suggested for maximum end results? Also would the gaseous and chemical fumes generated by the mining smelters in El Paso prove detrimental?

M.D., Connecticut.

ANSWER:—In attempting to evolve a solution for the case in question it is important that one consider by what mechanisms an asthmatic person may expect to benefit as a result of a change in geographic location. The following are some of the explanations for the relief of asthma by a change of climate: 1. The removal of the patient from his allergenic environment may mean simply that a dog or cat or occupational source of allergy has been left behind. Or it may mean that the new general environment does not contain the same pollens, fungi or other atmospheric contaminants which were the cause of the patient's allergy. 2. In bacterial asthma, in asthma due to bronchitis or in cases in which the allergic asthma has become complicated by bronchitis, benefit may be obtained because of the favorable effect of some climates and regions on infectious respiratory processes. 3. Temperature changes, humidity and other physical atmospheric factors are known to affect asthma, both of allergic and intrinsic origin. As a simple illustration one may cite the ragweed sensitive patients who are most prone to precipitate their attacks of asthma after a sudden temperature change, fall in barometer or electrical storm. In certain regions such atmospheric contortions are at a minimum, so that some asthmatic patients are freed from one of the most potent causes precipitating their attacks. 4. An unclean air, due to soot, fumes and other chemical or mechanical irritants, may be an important factor. Some suburbanites may leave their home in apparent comfort and experience an attack of asthma when arriving in the city, particularly if atmospheric conditions have resulted in a low hanging, soot containing fog. Such patients may be benefited in rural districts, whether a few or several thousand miles away. 5. Psychogenic factors may also be at play in a climatic change. Benefit may be derived because of relaxation, being away from business or home environments and tensions, and because of the general psychic effect of a more pleasant climate. 6. Unexplainable influences may result in benefit to asthmatic patients not falling in the categories mentioned.

In applying these considerations to the case of the 5 year old boy it is quite evident that the information furnished is not entirely sufficient to justify an absolute opinion. It seems probable that three factors are at play in this case: allergy, bronchitis and influences of chemical irritants. If the pollen allergy is of major importance, southern California (Los Angeles, Pasadena, San Diego) should be satisfactory. If bronchitis is actually a prominent feature, Tucson would probably be the most desirable. If gasoline and similar chemical factors are largely to blame, the smaller communities in southern California or, perhaps, Tucson would be best. However, in such instances a home in a rural district in the patient's home state may also suffice. If weather changes seem to play a great part in the attacks, Tucson would be the best possibility. Attention should be called to the fact that, whether one can or cannot classify the patient in any of the groups mentioned, the individual's behavior is not entirely predictable. For a final opinion of the suitability of a chosen location or of even the desirability of any change, actual trial is the only answer.

No immediate information is available regarding the gases and fumes generated by the mining smelters in El Paso; if present in noticeable concentration, they would certainly be detrimental.

The reference of the inquirer to a "cure" is deserving of comment. Generally speaking, asthma due to allergy is not

cured by climatic change; it is only temporarily checked. The allergic irritation returns on the patient's return to his environment. Cure can be expected only in those cases in which the bronchial infection or inflammation has become the most important reason for the continuation of the asthma. In such instances the healing of the inflammatory process may condition the respiratory tract to be less susceptible to infection and perhaps also to allergy.

PLANTAR WARTS

To the Editor:—May I request information on the most effective treatment for the removal of plantar warts?

Captain, M. C., A. U. S.

ANSWER:—Plantar verruca is one of the most difficult dermatologic problems. Probably because of the thickness of the epidermis of the sole and the constant pressure on verrucae in this region, they are much harder to cure than in any other location. They are of the same nature and yield when curable to the same measures but less readily.

After the usual popular remedies, including suggestions have been tried and failed, the preferred treatment, painless, prompt and not apt to cause scars, is irradiation. MacKee (X-Rays and Radium in the Treatment of Disease of the Skin, ed. 3, Philadelphia, Lea & Febiger, 1938, p. 638) recommends small doses compared to those used by others, 300 roentgens for most cases, sometimes 450 to 600 roentgens. He warns against more than two doses, preferring to use electrodesiccation for further treatment. He insists on protection with lead foil to the very edge of the lesion and warns against use of the rays in inflamed warts or those that have had caustics used on them. In these cases wait for the irritative effect to subside before irradiating them. Allow at least a month after the last irradiation before using any irritating treatment.

Radium may be used, a half strength plaque with 1 mm. of aluminum, fifteen to thirty minutes or even longer. In thick hyperkeratotic lesions gamma radiation may be employed, using the half strength plaque with 1 mm. of brass and 1 mm. of aluminum for one to two hours or longer.

The use of electrosurgical modalities is perhaps the most popular of all methods of treating plantar warts and is effective in a good percentage of cases. It is difficult to use in young patients, however. One may use light applications repeated every week or two for a series of treatments.

CONTAMINATION OF FOOD WITH CIGARET ASH

To the Editor:—How harmful is cigaret tobacco ash, for example, when it is accidentally spilled on food and the food accidentally eaten?

M.D., Massachusetts.

ANSWER:—The ash of cigaret tobacco itself may contain traces of lead or arsenic, as well as carbon and mineral constituents, but in itself it is not harmful when ingested in small amounts. However, the incompletely burned cigaret tobacco behind the burning point may contain rather high concentrations of tobacco alkaloids, and so care should be taken to avoid contamination of food with material from the stump, behind the ash. Nicotine poisoning, with fatalities, has been reported from contamination of food with cigaret residues, but it is the unburned material, not the ash, which is here responsible.

Reference:

Bogen, Emil: The Composition of Cigarets and Cigaret Smoke, THE JOURNAL, Oct. 12, 1929, p. 1110.

LACERATED RECTUM FROM JOHNSON GRASS

To the Editor:—I want to report a case which, to me, is most unusual. A patient came in on July 10, 1944 complaining of severe lower abdominal pain. There was a rigidity of both sides of the lower abdomen. The abdomen was tender in this region, and there was a rebound tenderness also all over the whole lower part of the abdomen. He gave a history of having gone to a public toilet and, finding it occupied, he went into a nearby orchard. He sat down quickly, and a stiff stem of Johnson grass entered the anus without producing visible injury to the anal opening. Because of the findings described and a white blood cell count of 22,000 within two hours after the injury, I opened the abdomen by means of a midline incision. On the anterior aspect of the rectum a lacerated longitudinal tear was found in the rectum about 1½ inches long. The lower part of the wound was just above the cul-de-sac. I closed the laceration with interrupted sutures of chromic catgut. The whole area was liberally sprinkled with 5 Gm. of sulfathiazole crystals. The abdomen was carefully wiped and the abdomen closed without drainage. The patient was put on a nonresidue diet and six days after operation was given a saline laxative. The wound healed by first intention except for the lower third, from which there was a small amount of subcutaneous drainage. He has made an uneventful recovery.

Ewald A. Larson, M.D., Kingsburg, Calif.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 6

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

OCTOBER 7, 1944

THE ROLE OF THE GENERAL PRACTITIONER

CHAIRMAN'S ADDRESS

J. CRAIG BOWMAN, M.D.
UPPER SANDUSKY, OHIO

Events on the home front in the last three years demonstrate more clearly than ever before that the general practitioner is still the central figure of American medicine.

COLLECTIVISM VS. AMERICANISM

We general practitioners, by virtue of our training, diagnostic services and analytical inclinations, are well equipped to help lead this country out of its economic and social maze. To do this best we must enter the lists first as citizens, and as doctors only when we can aid in the interpretation of the origin and the nature of the deteriorating social processes which are now plaguing this earth. We must come to the defense of those principles of government on which our fathers founded this nation. No other principles of government or system of medicine have ever succeeded so well. These principles, in recent years, have been challenged by those who would seek to give security against fear, want and sickness by taking from those who have and giving to those who have not. Those active in this movement fail to realize that these goals, which sound so attractive when they are defined by glittering generalities, can be obtained only through the redemption of man and never by the redistribution of what little real wealth is to be left in our land.

This strange ideology, entirely foreign to our country, is infiltrating itself into the muddled thinking of our people. We must recognize that, however attractive this sounds, social security demands that each citizen give up his individuality, his integrity, his intelligence and his independence in order that he may share in the redistribution of existing wealth. As biologists, we physicians know and must not hesitate to point out that nature has tried this pattern over and over again and has never produced anything more progressive than a colony of social insects—a heap of ants or a hive of bees. In terms of social progress, this biologic pathway has a blind ending. As physicians we must make our own patients see that social progress can come only as we emphasize the dignity of the common man, so that through variation in behavior this independence may here play its proper role in evolution.

HEALTH

The time has come for both the medical profession and the public to think more clearly about the relationship of the physician to the social order. Furthermore,

Read before the Section on Miscellaneous Topics, Sessions for the General Practitioner, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

it is important that the public begin to have a definite appreciation of both health and sickness.

Health is not negative. Health means more than simply keeping out of a physician's office. It is a positive condition of the body which gives us a long life of zest and buoyancy. Proponents of social insurance confuse, purposely no doubt, health with sickness and insist on labeling sickness insurance plans for indemnification in cash or in kind as health insurance, which they never are.

You and I, and every physician, have dedicated our lives to binding up the wounds and relieving the suffering of mankind. Advances in infant feeding and in immunization have made it possible to add a great many years to life expectancy in our time. These added years have brought upon us the added responsibility for the care of literally millions more who now suffer with degenerative diseases but who would have been dead long ago in another century. Likewise, as a result of this increase in life expectancy, we are confronted today with the ever increasing problem of the infirm aged. If society does not find a way to keep its old people healthy, alert and vigorous, the problem of their care threatens to break down completely the economic structure.

It is beginning to be appreciated that the chronically ill can only be repaired, never cured, even by the best of medical services. They cannot be restored to a truly healthy state. Modern science has done wonders in its attack on acute infectious diseases with serum and "miracle drugs." But those chronically ill with degenerative diseases can be treated only symptomatically and their lot made easier. This role of comforter, if it is to function at its best, involves the ideal physician-patient relationship.

MALNUTRITION THE CAUSE OF DISEASE

Medical research made one of its greatest contributions to human welfare when it began to produce positive evidence that improper or inadequate food, and a consequent state of poor nutrition, is the underlying cause of many diseases. Not only were organic diseases so identified, but poor nutrition was found to interfere with the proper working of the bodies of man and his animals.

Sickness produced by deficient foodstuffs was found, for the most part, to be chronic and crippling in character to both mind and body. We are coming to realize that chronic sickness due to faulty nutrition is the largest single factor in the lives of literally millions of the people who consult us but who do not, however, exhibit organic disease. They are simply poorly nourished and do not have their natural vitality. They have little or no vigor. They do have, as a consequence, an increased susceptibility to all kinds of infections and degenerative diseases. How to restore these chronically half-sick people to robust health before it is too late is a fundamental social problem.

This problem is not one of the redistribution of pills. It makes little difference who gives what colored pill to whom. What I am trying to say is that no plan of voluntary or compulsory sickness insurance will solve this problem. It is purely a matter of prevention through education, and sound nutrition and proper eating must become popular through education.

Let me illustrate what I mean by the studies which have been made on the Cincinnati Negroes. In the slum areas where the food supply, food preservation and food habits are all bad, they die like flies from rheumatic fever, tuberculosis and other diseases brought on by lowered resistance. In a Negro suburban village, under the average suburban standards of living, the relatives of these same Negroes die at the same rate and with the same diseases as do the white people of the neighboring town. Now one is particularly interested in the health problem of an individual colored citizen in these slums. Nutrition remains a personal matter. Once, however, his malnutrition has lowered his resistance and he is attacked by tuberculosis, then he is taken to a magnificent institution with marble halls. Doctors and nurses are provided in abundance to study his "case" and to serve him. Too often it is too late! The farm crops that we didn't raise and the milk that we didn't produce would have prevented him from ever getting tuberculosis in the first place. Prevention is the thing that is needed in meeting these problems, and the best preventive is good nutrition.

Or again—let me illustrate this point that much of the chronic half-sickness and of our disease is the result of malnutrition for which the medical profession cannot be blamed. Furthermore, any attempt to meet this situation on a nationwide scale with so-called adequate medical care will certainly bankrupt our economy. And the sad part of it is that there will be just as much sickness at the conclusion of the experiment as there was at the beginning. You will recall that during the depression the Dental Society of the State of Pennsylvania offered to fill free of charge the cavities in the teeth of all the children whose parents were on relief. This was, indeed, a noble gesture on the part of those dentists, and it cost them an immense amount in time, money, material and energy. The cavities, however, continued to develop faster than the dentists could fill them. This was because the children weren't getting enough foods rich in calcium and vitamin D. They were not getting milk and sunshine. It is therefore to be hoped that public attention will not become fixed on some scheme for getting sick people to a physician, but rather that the public will realize that these undernourished people are sick and always will be sick with one disease or another as long as they live, unless their nutrition can be restored. Prevention, I must insist, is needed, and this is a task for all of Society and not a task for physicians alone.

OUR PATIENTS

Those of us who are engaged in general practice realize, as many other people do not, that some of the basic relationships which governed the art of healing, before the separation of medicine from religion, are still needed in the handling of sick patients. At least one half of the patients seen in the office of the general practitioner do not have the typical diseases that are described in our textbooks on the practice of medicine. They are, on the contrary, victims of functional disturbances and frustrations, which have come primarily from bad adjustments to environment, and are increas-

ingly common in these days of perplexing social and economic stress.

These half sick patients demand something more than the right of the individual to select his own physician. They must, however, have this right and exercise it if they are to have confidence in their adviser. Such patients must develop a relationship which will inspire in them confidence in the judgment and advice of their own personal physician.

This is a challenge which we readily accept. In so doing we utilize our art and skill in such a manner as to bring the patient quickly to a realization that the doctor whom he has chosen as his physician and counselor has had intimate experiences in directing the lives of others and in helping them to sublimate their frustrations and to adjust themselves more satisfactorily to all the other problems which arise in life. To meet this challenge the general practitioner must continue to be more than a scientist—he must still be teacher, philosopher, counselor—friend.

PERSONAL PREVENTIVE MEDICINE

When one attempts to look into the future, it is difficult to see the end of present social trends. It is certain, however, that the practice of personal preventive medicine will become increasingly important. It will place greater responsibility on the shoulders of the physician in general practice. No health department or any other agency, regardless of how well it is manned or financed, can handle this completely. The host of procedures—immunization, vaccinations, examinations and analyses—that the alert citizen is supposed to have done for him even now is beyond the resources that are conceivable for any public health department. This requires a complete and mutual understanding and cooperation of the family physician and his families and opens a great field in personal preventive medicine. The public will be fully appreciative in every sense of these services if it is allowed to cooperate and understand.

SERVICE FOR THE RETURNING SOLDIER

Following the war—even before it ends—the medical profession will be confronted with the vital task of helping the millions of men returning from the service to readjust themselves to civilian life and to help restore them to physical and mental fitness. No one is so well fitted to help these men to make the necessary mental readjustments as the general practitioner.

After the war we shall need to have a knowledge of many strange diseases which the boys will bring back with them from many foreign shores. Many ex-service men will become institutionalized unnecessarily unless each one of us prepares himself to render the kind of service which these men will need and will want. The unusual mental impairments of sickness will make it imperative that these men get counsel and advice from some one on whose judgment they will rely and who is competent to analyze them as whole human beings, not simply as battle casualties—and a beautiful specimen for a case report. Psychosomatic medicine is a new name for this use of sound judgment and intelligent understanding of life that has always characterized the work of a good general practitioner.

CONCLUSION

Today we stand on the threshold of a new era in medicine—an era which offers a great challenge to any one in general practice. If the physician will continue to develop his relationship with his families along the

lines that I have tried to suggest in a general way, he will continue to render a distinct service to a large portion of our people. At the same time he will make a definite contribution toward molding the pattern of the future practice of the art and science of healing.

208 South Sandusky Avenue.

STANOCOLA MEDICAL CARE PLAN

JAMES M. ADAMS, M.D.

NEW YORK

The features of the Stanocola Medical and Hospital Association are as follows:

1. It was conceived and organized and is owned, supported and operated by employees.
2. Membership is entirely voluntary.
3. It supplies necessary medical, hospital and nursing services to employee members and to their families.
4. There is only one rate of dues, regardless of the number of dependents.
5. The medical staff is on salary and mainly on full time.

Although it is employee owned and operated, the company is much interested in its success and lends its support by:

1. Making payroll deduction of dues.
2. Permitting deduction of dues from the company thrift fund. This fund is supported by regular, voluntary contributions by employees and by the company. Dues collected from this fund, as 85 per cent of them are, represent both employee and company contributions. Through the medium of this fund, members of the association thus receive material help from the company in the payment of their dues.
3. The company has aided the association substantially by making a large donation toward the purchase of its clinic building and on other occasions made contributions for special purposes.
4. The board of directors of the association has always included two or more of the company's executives, elected by the membership.

The association is entirely distinct from the company's medical department, whose work is limited to industrial medicine—preventive medicine and the care of industrial injuries and diseases. It was organized and the collection of dues begun on April 1, 1924, and services were offered beginning July 1 of that year, so that it has now operated successfully for twenty years.

In the early 1920s the employees of the Standard Oil Company of Louisiana in Baton Rouge had suffered a reduction in income. At a general conference of representatives of the employees and the management, opinions were expressed by employee representatives that the cost of living in the city, which at that time was largely a single industry town, had not been reduced commensurately with that of the country as a whole or with their loss in income. Committees of employees were created to consult with various business and professional groups in the city seeking a reduction in prices and fees. Among these committees was one to consult with the medical society looking toward a return to the schedule of fees customarily charged prior to the war.

This committee was unsuccessful in its mission, and after many discussions an association was launched with the object of securing a reduction in medical costs.

This was composed of 1,300 employees, who made an agreement with four physicians in the community to pay them a retainer of one dollar a year for each member. The four physicians divided this fund and agreed to treat the members and their families at one half the usual fees.

As was to be expected, this arrangement was unsatisfactory both to the members and to the physicians and the arrangement was not renewed after one year. The experiment served, however, as a basis for the promotion of the Stanocola Medical and Hospital Association.

At that time there were few organizations attempting to supply group medical service and no precedents to guide the founders, so that the project had to be inaugurated on a strictly experimental basis. There were then no Blue Cross Hospital plans, and in that area about the only group medical care was supplied by lumber companies to their employees, usually in isolated camps. Deductions from wages were compulsory and a doctor or doctors were employed by the companies to care for the medical needs of the employees and their families. In many instances the revenues from the collections were much greater than the expenses, and the companies were in effect practicing medicine for profit. Only the largest companies supplied hospitalization and then in hospitals of their own. The service was often inadequate and inefficient.

It was decided that 2,000 members would be a minimum for beginning operations, and after a thorough canvass of the refinery personnel the experiment was launched with 2,200 employees and their families participating. Arrangements were made with several private practitioners to treat the eligible beneficiaries, utilizing their own offices. Included in the panel were a surgeon, who served as medical director, and an ear, nose and throat specialist. After about six months of operation a group of offices for a clinic was rented and all physicians except the surgeon were placed on full time. Three years later the surgeon and medical director was employed on full time.

In 1931 the group, having outgrown its quarters, purchased a large residence in a convenient location and converted it into a clinic, which is still in use. The staff now consists of eleven doctors on full time and five on part time. Of the physicians on full time two are surgeons, one of them serving as medical director, a pediatrician, an ear, nose and throat specialist, an obstetrician and gynecologist, five general practitioners and one of the older physicians, who confines his work to anesthesia and office practice. One of the general practitioners, who also is one of the older men, is located in a nearby town and cares for the members residing in that immediate community. Of the part time physicians one is a roentgenologist, two are general practitioners in nearby towns and the other two are used for relief work in the pediatric service. Two of the physicians are women.

In addition to the medical staff, six nurses (two graduates and four nongraduates), two laboratory technicians, an x-ray technician, two office girls and a cleaning staff are employed in the clinic, and a couple living in the garage look after telephone calls when the offices are closed. Hours at the clinic are from 8:30 a. m. to 6 p. m.

The character and training of the medical staff are excellent. All physicians are graduates of approved medical schools and most of them have had postgraduate training. All are members of the American Medical

Read in a panel discussion on "Variations in Industrial Medical Service Plans" before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

Association and two are fellows of the American College of Surgeons.

There are seven suites of offices, most of them used by two physicians at different periods, and their hours are staggered so that there are always several on duty throughout the day. Each doctor has one day off each week. There are clinical and x-ray laboratories, physical therapy treatment rooms, and a pharmacy operated by a drug store chain which fills prescriptions at a 15 to 25 per cent discount. New x-ray equipment has just been installed, which includes in addition to the regular x-ray machine a fluoroscope and a wall dental unit.

Aid provided starts with medical and surgical services limited only by the capacity of the staff. Patients are treated in the clinic, in the hospitals or in their homes within a radius of 7 miles of the clinic, as indicated. Beyond the 7 mile limit a small mileage fee is paid by the patient to the doctor. Hospitalization is at ward rates except that private rooms are provided for contagious diseases and where privacy is a necessary part of the treatment. The general hospitals in Baton Rouge are used and accord special rates to the association. Special nurses are provided where they are considered necessary. Hospitalization and nursing costs are limited to \$250 for each case. For those members who call a physician who is not on the association's staff, hospitalization and special nurses may be supplied up to the maximum at the discretion of the medical director. Hospitalization of normal maternity cases is not provided. However, on the advice of the association's obstetrician, practically all normal obstetric cases go to a hospital for delivery, with hospitalization costs at the patient's expense. Hospitalization and special nursing have recently been authorized outside the Baton Rouge area. Medicines other than those administered in the clinic are not supplied. Services are the same for employees and for their dependent families. Dependents eligible to services are limited to parents, spouse and children. Other dependent relatives may be included by the payment of additional monthly dues.

Dues were set in the beginning at \$2 per month for each member. No distinction is made in dues for members with dependents from those who have none. The board of directors was authorized to make up to one assessment equaling a month's dues in each quarter. As it was found necessary to make a number of assessments regularly, dues were increased and are now set at \$3 a month, with three assessments of \$3 permitted during any one year. On an average two assessments are now being made annually, bringing the cost to \$42 per member year or \$3.50 per member month. It has been suggested that the dues should vary with the number of dependents and possibly with the income of the members. But the organizers wanted a fully cooperative association and considered the single rate to be as equitable as single rate group insurance premiums. It has also been suggested that the dues be increased to \$3.50 per month, as that is the actual present cost. But the board of directors regards the present plan of dues with assessments made only as required as preferable. The x-ray department is supported separately from the other services, and assessments are made as needed for its maintenance. One assessment annually, included in the two mentioned, is usually sufficient. For employees who wish to enroll dependents other than parents, spouse or children, one dollar a month is charged for each such dependent.

In 1930 the association was incorporated as a non-profit organization with capitalization at \$100,000, represented by five thousand shares of stock at \$20 each, every member being required to purchase one share of stock which may be paid for at the rate of \$1 per month. These funds are for use for capital investments, improvements and new equipment. The stock carries no voting power and is of value only in the event of liquidation. All stock has now been subscribed, and an initiation fee of \$20 is substituted and required of each new member.

The business management of the association is vested in a board of directors consisting of eleven members elected by popular vote for overlapping terms of two years. Eight are elected from specified groups of departments and the remaining three from the membership at large. Ever since the organization of the association, two or more members of the board of directors have been executives of the company elected by the membership at large. The professional direction of the staff is in the hands of the medical director and there is no interference from the board in any professional matters. The cooperation between the board as business managers and the chief surgeon as professional director has always been excellent.

Disbursement of Revenues

	Percentage of Revenues	Monthly Cost per Member	Monthly Cost per Beneficiary
Doctors' salaries.....	40%	\$1.40	\$0.26
Hospitalization.....	20%	0.70	0.18
Special nurses.....	10%	0.35	0.09
X-ray department.....	6%	0.21	0.06
General and administrative expense.....	18%	0.63	0.16
Other expense.....	5%	0.17	0.04
To surplus.....	1%	0.04	0.01
Total.....	100%	\$3.50	\$0.90

The expansion of services has been slow and careful. New ventures have been embarked on only after long and serious study. For example, when the x-ray department was inaugurated it was as an extra service and was supported by charges against the patients for x-ray examinations. As this plan was contrary to the strictly cooperative spirit of the association, it was decided by the membership to support it by assessments as required against all members and to make the service available without additional cost to those needing it.

During most of the period of its existence its membership has comprised 80 to 90 per cent of the eligible employees. It now numbers 4,600 members, with 18,000 persons eligible to services. The rapid increase in employment at the plant during the war period has posed a problem. Additions to and replacement of the medical staff have been almost impossible to secure because of the doctor shortage. In order to avoid contracting for more services than their available facilities will permit, new memberships are being restricted to employees with a year or more of service, and the regular staff has been supplemented by the part time employment of local private physicians.

The association now has assets amounting to \$140,000, represented by real estate, equipment, war bonds and cash. It has been suggested that an organization with an annual budget of almost \$200,000 should have a larger reserve for epidemics and catastrophes. Actually the amount of service rendered is strictly limited by the facilities available in the community and little more can be provided, regardless of the needs, than is now

being supplied. While the number of members has increased one third in the past two or three years, the increase in the amount of services rendered has been much smaller. In fact, special nursing services supplied were actually less in 1943 than in preceding years, simply because there were often no nurses available when needed. The flexibility of income resulting from the authority to collect assessments cares for normal fluctuations in costs, so that the financial structure seems adequate.

During the seven years 1936 to 1942 the revenues have been disbursed in average proportions shown in the accompanying table.

ADVANTAGES TO MEMBERS.

1. The members of the association have adequate medical hospital and nursing care for themselves and for their families at a predetermined cost. The total cost is probably as great as if the group purchased the service individually; but they have probably received more service than they would have purchased as individuals.

2. They have been supplied with services at least the equal in quality of that otherwise available, and superior to that usually received by persons in the same economic group. They have had the advantage of much freer consultation with specialists than they would have had otherwise, and laboratory and x-ray examinations are more freely used.

3. They have escaped a not infrequent cause for strangling debt—large medical and hospital bills.

4. They have the satisfaction of providing this care for themselves and their families by their own efforts rather than having it handed to them.

ADVANTAGES TO THE EMPLOYER

1. Adequate medical care for the employee is provided, with return to duty with the minimum loss of time.

2. Close cooperation exists between the company's medical department and the employee's physician.

3. It is easier to persuade employees to have physical defects corrected than it would be otherwise.

4. Fraudulent claims of industrial injury are reduced.

5. The morale of the employees is improved by freedom from worry over costs of illness and by the satisfaction of providing such excellent medical care through their own efforts.

ADVANTAGES TO THE MEDICAL STAFF OF THE ASSOCIATION

1. The compensation is probably higher than the average in the community in normal times.

2. The inconvenience of carrying on an individual business is avoided.

3. Each physician has one day off each week and an annual vacation with pay.

4. Postgraduate training at the expense of the association is provided on occasions.

5. The close association and consultation with other physicians stimulates them to better work.

CONCLUSION

In 1932 a study of the association was made by Dr. Rufus Rorem of the Blue Cross Hospitalization program of the American Hospital Association, at that time representing the Julius Rosenwald Fund, and Dr. John H. Musser, professor of medicine at Tulane University and past president of the American College

of Physicians. Their report was published in book form under the title "Group Payment for Medical Care" and approved the work of the association. Dr. Musser commented on the maintenance of the personal relationship of the physician and the patient. Free choice among the general practitioners is permitted, and the physician stands in the same relation to the patient as the "family doctor."

The association members, the management of the company, the company's medical department and the medical staff of the association are convinced of the value of the organization for this particular group. It is equally recognized that it is not necessarily the ideal plan for all groups.

Standard Oil Company (New Jersey), 30 Rockefeller Plaza.

VARIATIONS IN CURRENT INDUSTRIAL MEDICAL SERVICE PLANS

M. S. BLOOM, M.D.

BINGHAMTON, N. Y.

Industrial medicine is probably more widely practiced in the Binghamton area than in any other part of the country. For a number of years I have been medical adviser for several concerns in Binghamton and surrounding cities. While I have been associated with industrial medicine, I have also continued to maintain a private practice. This has enabled me to understand both sides of a subject which has made significant development in recent years.

At present I am medical director in six industrial organizations with a total of over 5,000 employees and about 2,000 dependents participating in prepayment medical care. I shall try to present a few of the details concerning some of the plans under my direction.

In 1913 a Mutual Benefit Association was organized at the Dunn and McCarthy shoe factory by the employees. Sickness and death benefits were provided. Later a registered nurse was hired and a complete and well equipped first aid room was established. In 1916 I was employed as the company doctor to conduct a clinic every morning and to visit sick employees at their homes. There were 1,200 employees at the time. The company contributed 50 cents for every dollar contributed by the workers. In 1923 the firm started contributing dollar for dollar, and new services were added. This association gradually expanded until we now have a fairly complete coverage of the medical, hospital and dental needs of the members. In 1928 care for dependents was instituted. The benefits for dependents include major and minor operations, hospitalization at ward rates, laboratory and x-ray service and care of fractures. There is a limit of \$250 to be spent per contributor annually for his dependents.

In paying for and drawing sick benefits, members are divided into classes according to their weekly earnings. Dues are 15, 20 and 25 cents a week, and 10 cents additional for care of dependents. We feel that this method of contribution is most satisfactory because those in the lower income groups have an equal opportunity to share benefits with those in the higher income levels. It also affords those paying greater contributions sick benefits in proportion to their dues.

Read in a panel discussion on "Variations in Industrial Medical Service Plans" before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944

Any employee may join the association, but he must pay dues for two months before he is entitled to benefits, six months to be eligible for hospitalization and operation, eye examinations, x-ray and extraction of teeth, and one year before receiving sick benefits when he is operated on. No member can draw more than ten weeks' sick benefits in a year, and not more than \$350 can be spent on any member in a year. This is a limitation placed by state law.

At Dunn and McCarthy's the twenty-two year average cost per employee was \$18.53 annually; the sixteen year average cost per contributor for his dependents was \$13.43; the cost per dependent was \$5.17 a year. These figures are significant because they furnished a basis for the organization of other mutual benefit associations in other industries. There are many ramifications to the Dunn and McCarthy plan which I have not time to go into here. It is based primarily on the contract method of practice. The workers are allowed to choose their surgeons, specialists and dentists.

In 1930 a benefit association was organized at the Spaulding Bakeries plant in Binghamton. This plan was later extended to the other Spaulding plants in New York State and Pennsylvania. Originally this association was organized on a contract basis. After two years the question arose as to whether it would be possible or feasible to allow the employees the freedom of choice in the selection of their physicians. It was found that, although some of the members paid dues in the association, they continued to go to their own physicians. The officers of the association sensed a tremendous advantage in the personal relationship which exists between a physician and his patient and the desirability of maintaining that relationship through the association. It was decided to try giving the members the right to choose their physicians. We were pioneering and had no assurance what the outcome would be. The reorganization of the association under the new principle succeeded beyond our hopes. It was proved that the principle of freedom of choice was the ideal setup. The doctor himself now had a stake in the success of the plan, and the patient knew the limitations. The doctor knew that he would get paid for the services he rendered and he knew there were limits to what the association could afford to pay. We believe, after considerable research, that the Spaulding Employees' Mutual Benefit Association was the first to establish the fact that complete freedom of choice was workable and effective.

The average annual cost per member in the Binghamton plant for eleven years was \$26.77, for nine years in the Elmira plant \$24.73, for eight years in the Oneonta plant \$14.94, for eight years in the Wilkes-Barre plant \$14.93, and for seven years in the Middletown plant \$19.30. The average annual cost per member in the five plants was \$20.13.

In the Binghamton plant we have limited care of dependents. This care includes house and office calls, x-rays and laboratory fees. The average annual cost per contributor was \$19, and \$9.40 per dependent. There is a limit of \$50 a year to be spent in any year per contributor for his dependents. Dues are 25 cents a week per contributor.

The success of the association at Spaulding's led to the organization in other local industries of other associations based on the same general form. In some instances it was the result of employees asking their employers for a plan for prepayment medical care.

Probably the most convincing evidence of the value of medical departments in industry is the fact that where these departments have been established they continue to exist and to increase in usefulness. Employers and employees soon realize the advantages.

In 1929 the Ansco Corporation organized a mutual benefit association, which operated for four years on a contract basis. The success of the Spaulding Plan under freedom of choice led us to adopt the same principle at Ansco in 1933. The company contributed 50 cents for every dollar contributed by the employees.

In February of 1943, because of increased costs of hospitalization, dues had to be raised from \$1 a month to \$1.25. The company agreed to contribute 75 cents a month for each member. With the increase in dues, x-ray and extraction of teeth were added to the benefits and \$4 a day was allowed for hospitalization instead of the \$3 originally allowed. We found that, with the added income, expenses were less than anticipated, so on Nov. 1, 1943 we increased the allowance for x-ray and laboratory and gave sick relief when the patient was operated on or hospitalized. The total allowance to be spent per employee annually was increased from \$250 to \$300.

Ozolid Products Division was incorporated into the Ansco Association in 1941. Benefits in these associations now include major operations with an allowance of \$100, minor operations up to \$50, tonsil operations \$40, hospital, with a thirty day limit, \$4 a day, anesthetic \$5 to \$15, operating room fee \$5 to \$20, ambulance \$6, laboratory \$20 a year, electrocardiographs \$30 a year, consultations \$10 a year, x-rays \$40 a year, surgical office calls \$50 a year, refractions \$5 a year, x-ray and extraction of teeth \$25 a year, \$3 allowance for house visits and \$2 for office visits with a limit of \$30 to be spent annually. For oxygen and transfusions there is an unlimited allowance. Benefits of \$10.50 a week or \$1.50 a day are paid after seven days of illness for not more than seventy days a year; after seven days' hospitalization for not more than thirty-five days. There are over 3,000 members participating in the Ansco Mutual Benefit Association. The average annual cost per member for an eleven year period was \$18.25.

In March 1944 we added care for dependents at Ansco. The dues are \$1.50 a month. Wives and dependent children under 18 years of age are entitled to major and minor operations, hospitalization for thirty days a year at \$2 a day, care of fractures and maternity care. We placed a limit of \$40 for doctor's fees for maternity care, plus the allowance for hospitalization. Dependents of members who enter the armed forces will be eligible for benefits, provided the monthly dues are paid.

During 1943 the Ansco Mutual Benefit Association paid 147 doctors in sixty-seven different cities and fifteen different states. This was in addition to the 102 doctors used in the city. Hospitalization was provided in twelve different hospitals and the employees used 33 dentists out of town and 23 in town.

Our policy has always been to extend benefits rather than to reduce contributions as funds accumulated. In all the associations the members are asked whether they wished to contribute additional amounts for additional services. In all cases of extension of benefits and additions to dues the members have voted for it by a large majority.

The smallest mutual benefit association is at the Binghamton Die and Machine Company, where there are less than fifty employees. This association has been

operating successfully since Jan. 1, 1937. Coverage is practically the same as in the larger associations. The average annual cost per member for the seven year period was \$17.97.

The newest association is at the H & A Manufacturing Company. This went into effect on May 1. It is different from the other associations in that the employer is paying the entire cost.

The expenditures in each association vary but little. These variations are determined by the length of time the association has been in operation, the number of employees and the size of the contributions of the employer and employee.

The real measure of any plan is not its good intention but its actual achievement. The associations in which freedom of choice is practiced are working with amazing success. We have developed a plan that is equally acceptable to physician and patient. Members can select from the outstanding physicians in the community. We know that individual attention by a skilled and interested physician is the best type of medical care.

Our experience indicates that with proper administration and with cooperation between the associations and the medical societies this type of service to the worker can be provided in industry on the basis of complete freedom of choice of physicians. It is evident that from small beginnings the mutual benefit associations grow rapidly to provide a more varied and more complete medical coverage.

One great advantage in our plan is that it can readily be adapted to every kind of industry, with the costs set at a point where the plan may operate successfully.

It has been thoroughly established that the people are interested in prepaying their medical costs. The costs of medical care should be distributed among groups of people and over periods of time. Americans cherish the right to exercise their free will and judgment. There must always be this right if American medicine is to advance in the future as it has in the past.

Freedom of choice of physicians is to be preferred to the contract or panel method. The patient receives attention without delay because all physicians in the community are available. Illness comes under skilled observation and much sooner than would be the case otherwise. Clinical methods are more widely used, and accurate diagnosis is more readily established. X-ray, laboratory and specialized services are available to those who otherwise could not afford them.

Under freedom of choice, the principles on which the practice of medicine were established have remained intact. There is better relationship between doctor and patient, a greater degree of cooperation in the medical profession and a greater feeling of good will between employer and employee.

Many attempts have been made to give adequate and efficient medical service and to make it easier for those of modest means to pay for this service. We physicians are sympathetic with efforts to improve conditions and deeply concerned with any attempt to change the fundamental basis of our work, but we must realize that, with the advances in medical science, other advances are being made. The maintenance of a strong medical profession is in the public interest. We must increase our efforts, because the physician has no more important obligation today than to assume a place of leadership in solving the economic and social problems bound up in the practice of medicine. The economic organization of medical care is now undergoing changes of great scope and magnitude. These changes are partly

because of the growth of public sentiment that health is a matter of social concern. Change based on anything but sound practices can result only in eventual detriment to the medical profession and the people.

My close association with industrial workers over a period of years has convinced me that they favor prepayment in order to free themselves of the worry of medical care. While industrialists have been willing to assume their part in the program of medical care, medical societies have been reluctant. These societies can efficiently handle the whole program. The medical profession will gain nothing and make no progress by working at cross purposes with the trend of the times or with the desires of the people. We must take an interest in medical economics and, through our medical societies, furnish the leadership necessary to make prepayment available to every one who wishes to participate.

110 Oak Street.

HEALTH PLAN PRINCIPLES IN THE KAISER INDUSTRIES

SIDNEY R. GARFIELD, M.D.

OAKLAND, CALIF.

We have a fundamental concept. Though there are certain hazards and occupational diseases peculiar to industry, these are rapidly being eliminated and are actually minor problems superimposed on the general health problem of the worker and his family. Industrial health actually resolves itself to be not an entity but the basic health of the American people.

American medicine surpasses that of the rest of the world in technical excellence. So far a large portion of the American people have been denied this medical care. This lack of distribution has led to numerous experiments to solve the problem. During the last ten years some three hundred medical care plans have developed. This is a significant trend of vital concern to the medical profession. Most of these plans have one common characteristic—"prepayment." From there on they deviate widely in amount of coverage, financial structure, organization and ideals.

Groups of experts have developed—so-called authorities—who are found in government agencies, foundations and labor unions, among employers, insurance companies and public health schools. Most groups are trending toward a united front, completely bypassing the medical profession—the trend toward government tax supported medicine.

Now there appears to be a definite drive to forestall the threat of government intervention by medical society operated prepayment plans. The facts are that prepayment itself is not enough. The majority of prepaid medical plans to date have failed and proved totally inadequate:

(a) The insurance company indemnity plans provide only a minimum of service.

(b) The Blue Cross plans have only limited hospital care and in addition have a possibility of dominating the medical profession.

(c) The medical society plans have been miserable failures. Starting with comprehensive coverage, they have dropped back to limited benefits; they have not

Read in a panel discussion on "Variations in Industrial Medical Service Plans" before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

been supported by the physicians; they have created no facilities, have not raised the quality of medical care and are too expensive and do not provide for preventive medicine.

In short, in addition to prepayment there must be some semblance of organization in methods of providing medical and hospital care so that the prepaid funds will provide the necessary coverage and sufficiently remunerate the physician.

Ten years ago we started providing medical care with no preconceived ideas and no plan. We had industrial work to do in areas where no medical or hospital care existed. We tried the usual method of fee for service and soon discarded it. We could not provide the service on that basis and the people could not pay for it. Out of our necessity evolved a simple plan that works. We have tested it under all sorts of conditions and in many areas with small numbers of men and large numbers—with scattered groups and concentrated groups. I would like to present this plan for your consideration.

The plan embodies three major principles: (1) prepayment, (2) group practice and (3) adequate facilities.

Prepayment needs no elaboration and is generally accepted as the only way people of moderate means can pay for increasing costs of modern medical care—the principle of spreading the cost so that the well pay for the sick.

Group practice, the second principle, results in many economies, the most important economy resulting from the highest quality of medical care for each illness. Most highly developed in the very universities that teach us medicine, few will deny the advantages of group practice, its stimulation to the physician, its ready accessibility for consultation, its better supervision and utilization of the younger and inexperienced physician, its productiveness in research and training. In fact, most physicians today have an unofficial association with a group of doctors; but these groups are totally unorganized, inefficient and costly.

Adequate facilities, the third principle, are equally important. By adequate facilities I mean bringing the doctor's offices, the hospital, the laboratory and x-rays together under one roof. Where such facilities are geared to serve one particular group we achieve the utmost in efficiency and economy and the greatest accessibility between doctor, patient and workshop, with a resulting tremendous economy in saving of travel and duplication of equipment and personnel. That in essence is the plan. Consider these facts: Utilizing these principles in just a period of twenty months we have served the medical needs of 80,000 people in the Oakland area. Our income has been prewar income, the same cost to the worker and the employer that we charged five years ago. Contrary to what you may have read, the people we serve are not a selected group; they are the 4F's, the aged and the physically unfit. Many would be considered unemployable in normal times. Incidentally these men have done an outstanding job in shipbuilding. We have no preemployment examinations. The unions will not permit that—a rebound from the old days when such examinations were used to keep men from working rather than for proper placement. As a result we have had a tremendous medical load. We have provided these men with more medical and hospital care than has ever before been provided a similar group of people. Despite these facts, the tremendous medical load and wartime increases in expenses, we have been able to remunerate

our physicians with incomes ranging from \$5,000 to \$15,000 a year net. We have been able to build and pay for close to one million dollars worth of facilities and equipment and in addition have provided about \$50,000 for training and research, all by the utilization of prepayment-group practice and adequate facilities.

You have heard and read many things about our organization. I can honestly say that the only thing wrong with what we are doing is that neither Mr. Kaiser nor I should be doing it. The doctors through their medical organizations should be doing the job. If they would, they could raise American medicine far beyond its present level, superlative as it is, and, what is more important, bring it to the people.

Those three principles prepayment, group practice and adequate facilities are the solution to medical care. There isn't a question or problem in medicine they can't answer. In effect it means organization of medical care, which has been delayed too long. It would preserve individual enterprise in medicine. Medicine has developed to the point of specialization where the individual physician can no longer be a separate enterprise. The individual group, however, can be. The free choice of the future will be the free choice of a group. There is a tendency to be conservative and move slowly in such matters, but it would be wise in this problem to take bold steps. Group practice needs no experimentation. It has proved itself in the clinics and universities of this country.

The job could be done on the basis of the state medical society and could cover all areas of the state, country and city with one statewide service. The doctors of the state could voluntarily align themselves into three groups: (1) those desiring to work in full time group practice on a budgeted yearly income, (2) those desiring to work part time with these groups at a salary and retain some private practice and (3) those desiring to remain in private practice. Those choosing full time group work would probably be the younger men and many of those returning from the armed services. Those choosing part time group work would be the middle of the road physicians who would not want to give up the private practice they had built up and would on the other hand wish to have some contact with the group. Those choosing to remain in private practice solely would probably be the older men with large lucrative practices who chiefly serve the well-to-do classes. These men could serve as consultants and teachers for the full time group on a fee basis.

So all physicians could align themselves in these classes. From those volunteering for full time group work a board of highly trained physicians could select ideal groups or as nearly ideal as possible and back them up with part time physicians. With careful planning the medical centers could be built in strategic areas, city and country, serving 50 to 60 thousand people each, these centers being staffed with the groups selected. Radiating from each medical center would be the diagnostic and treatment centers, bringing readily accessible care, preventive and curative, to the outlying areas.

Such a reorganization of medicine sponsored by the medical societies has unlimited possibilities. Neither government, industry nor anybody else could touch it. Under such an arrangement medical care could easily be paid for and therefore reach all the people. There would be an increase in net income to the physicians; they would live a decent life with time off for vacations and study and home life without worrying about losing

their practices. There would be a redistribution of medical care so that the country areas would be better supplied with facilities and specialties—a new hospital financial structure which would stand on its own feet and be controlled by the physicians. The younger physician coming out of training could be assured of an immediate good income and be utilized to the maximum of his capacity under supervision and there would be a great stimulus to research and training. And very important is the fact that medical care would remain in the hands of the physician, where it belongs.

One last word: Under such an arrangement the physician and hospital are better off if the patient never gets sick. With the modern discoveries in medicine and those yet to come, the medical care of the sick is a diminishing economy. Would it not be wiser to create now a new economy of medicine, remunerating the physician for keeping the patient well?

ENDICOTT-JOHNSON MEDICAL PLAN

EDWARD M. JONES, M.D.

ENDICOTT, N. Y.

The Endicott-Johnson corporation is engaged in the business of tanning leather and manufacturing shoes. Their factories are located along the southern border of New York State about midway between Buffalo and New York City. The principal factories are located in Johnson City and Endicott, villages of about 25,000 people each. Smaller factories are located in Binghamton and Owego. These communities are all geographically closely related, starting on the east with Binghamton, whose western boundary merges with that of Johnson City, and continuing on to Endicott, which is located about 5 miles west of Johnson City. Owego is about 18 miles west of Endicott.

In 1918 Mr. George F. Johnson, the founder of the company, decided to give to his workers a complete medical service, not only for themselves, but also for the dependent members of their families. He was prompted to do this as a part of a broad program to improve the living conditions of the workers and their families and to help them keep out of debt. He was firmly convinced that debt was a great factor in the unhappiness of the average worker and that, many times, unexpected large medical bills were the cause of this. He felt that relieving the worker of the cost of his own medical care alone was not sufficient and therefore included all those for whom the worker might reasonably be expected to assume financial responsibility in case of sickness. Although, during the years that have followed, the boundaries of this liability have varied somewhat, nevertheless that has been the general principle which has governed the extension of service to the dependents of workers.

There has never been any attempt to make this service a research institution. We have not tried to develop it as a model for other corporations. It has been an attempt to give the workers complete medical care of high quality with reasonable freedom of choice of physician, hospitalization, medicines, laboratory and x-ray examinations without any limitation except for the necessity of the case.

The expense of this service, which has varied from around \$700,000 to \$1,000,000 a year, has been assumed entirely by the company as an operating cost, except for the period from April 1931 to September 1933, when the cost was met by a 5 per cent payroll deduction. When business conditions improved, however, the company not only reassumed the cost of the medical department but, in addition, returned to each worker the total amount that had been taken out of the pay checks during the period of the 5 per cent deduction.

The number of workers eligible for service has varied somewhat during the ensuing twenty-six years but has averaged around 17,000. The average number of dependents has been around 32,000, or a little less than 2 dependents for each worker. At first all workers were included in the service from the day of their employment, but because of the abuse of this system whereby individuals could work for the company for a few days and then apply for medical care for some condition which had been in existence for considerable time and which might require prolonged hospitalization and major surgery for its correction, this was changed so that medical service was not extended to a new worker until after a probationary period of six months. In September 1940, when the accelerated defense program began to get under way, the company began to hire a great number of temporary workers. At that time it was felt that these workers would be on the payroll only temporarily, and if there was a falling off in business they would be laid off. This was an entirely new policy for the company, as during the several years of the depression of the early thirties the company had not laid off its workers but had shortened up the working hours somewhat and divided up the work as nearly equally as possible. It was decided that these temporary workers, unless already entitled to medical care as a dependent of an old worker, would not be eligible for medical care, and when they were hired they signed a statement recognizing this fact.

After Pearl Harbor, the loss of so many of our physicians to the armed forces and the difficulty in obtaining any replacements made it necessary to continue the exclusion of these new workers from the medical service. There were not enough suitable replacements available to enlarge the medical department to provide these new workers with adequate medical care. Gradually, however, we have been able to obtain a few additional physicians, some part time and others full time. This, together with the loss of almost 4,000 workers to the armed forces and the migration of many others to industries more closely associated with the war effort, reduced the patient load to a point where the company again decided to return to the policy of furnishing complete medical care to all workers and their dependents if the worker had been in the employ of the company for at least six months on June 1, 1944.

At the present time, then, the following groups are entitled to medical care:

1. All workers who have been in the employ of the company for at least six months.

2. Husbands or wives of workers not otherwise gainfully employed.

3. Children. If the father is an Endicott-Johnson worker, all children regardless of age who are not married or not employed elsewhere are considered dependents. If the mother is a worker and the father works elsewhere, he is considered the head of the family and medical service would be extended to the mother but not to the children.

4. Parents of workers. These have always been a problem as to just who is responsible for their care. If they make their home with a worker and are dependent on the worker for their living, they are usually considered eligible for medical care. Many times, however, there are several children in the family, some of whom work for the company and others work outside the company. Who is responsible in such a situation? Each of these cases is considered individually by the relief department, and if it considers that the responsibility is a divided one between those children working for Endicott-Johnson and those working elsewhere, frequently "limited service" will be extended; i. e., they may have the services of any of the physicians, the use of the facilities at the medical centers but not hospitalization or other service where a definite charge is made to the company. I think that you can see that the line of dependency is frequently a difficult one to draw and early in the history of the department there was some abuse of this extension of the service to dependents, so that occasionally parents not living in the Endicott-Johnson city area who were no longer able to work and who were in need of considerable medical care came to the Endicott-Johnson city area, were classified as dependents of a worker and extended medical services, even though they may have made their home with some other son or daughter before they began to be in need of medical attention. It did not seem as though these cases constituted a legitimate charge against the Endicott-Johnson corporation, and so unless the parents have made their home with the worker for some time and this seems to be their established residence, they are not as a rule extended medical care.

5. Individuals who are employed in the retail stores or the sales division. Such persons who do not live in the Endicott-Johnson city area are eligible for service if they come to the Endicott-Johnson city area, and many of these workers and their dependents do come to the medical centers or hospital for diagnostic study or elective surgical procedures.

During normal times we maintain three distinct medical centers, one in Binghamton, one in Johnson City and one in Endicott. The workers in Owego are cared for by a part time physician and referred to Endicott or Johnson City for any special treatment that may be necessary. In each of the medical centers there are available from four to seven physicians who are considered our general practitioners. Each of these physicians has scheduled office hours of two to three hours each day, and these hours are so arranged that there will be at least one physician in the office for office hours from 8 a. m. to 6 p. m. In addition these physicians make calls at the workers' homes and follow the patients to the hospital whenever their condition warrants hospitalization. Each center has an internist, at least one surgeon, an obstetrician, a pediatrician, an ophthalmologist and an otolaryngologist, who hold regular office hours and see patients as they are referred to them by the general practitioners. Antepartum and postpartum clinics and baby clinics are held by the obstetricians and pediatricians respectively. Practically all deliveries are cared for in the hospital. One syphilologist divides his time between the three centers and not only takes care of the venereal diseases but also performs cystoscopic and other genitourinary procedures. Laboratories approved by the state department

of health perform all the usual blood and body fluid examinations.

In each of the medical centers is a dental department. Here a staff of six dentists and four dental hygienists carry out a program including cleanings, fillings and extractions. Dentures and inlays are not included in this service.

The normal procedure, then, in case of illness would be something like this: The worker calls the medical center and states that his youngster is ill and needs a physician to call at the home. The clerk asks the name of the worker and checks this against a key file which is kept in each of the medical centers. If the name given is listed as a worker and the child as a dependent, the clerk asks which physician is wanted and the call, together with the name of the physician asked for, is listed in the call book. This freedom of choice of physician is given to the worker except when one particular physician has already received enough calls to keep him busy for that particular day. In such case the worker may ask for some other doctor. Many times the patient has not given a preference and then the call is entered in the call book as an open call and one of the physicians who has other calls in that part of the town or one of the physicians who does not happen to be so busy on that day takes that call. From 6 p. m. to 7 a. m. only one physician is on call at each of the centers and takes all the calls received between these hours. This night call rotates each night, so that normally each of the general practitioners is on call one night in six or eight, depending on the center to which he is assigned.

In case the illness is such as to allow the patient to come to the office, he may call the center and ask what time his particular physician has office hours on that day. Each of the physicians has a definite schedule of office hours. They usually are scheduled for two hours at the same time each day except that an attempt is also made to allow each physician to be one hour late in the afternoon so that the workers may see the physician of their choice on at least one afternoon without losing time from their work.

The specialists for the most part spend their mornings seeing patients in the hospitals or in the homes in consultation. Their afternoons are spent in the office seeing patients referred by the general practitioners or other specialists.

On Sunday and holidays one physician is on duty at each of the centers and takes care of all the calls and office work for that particular day. An attempt is made to limit this work to emergencies as far as possible, and the workers cooperate in this fairly well. In the hospital, one man of each of the specialties is likewise on call and attends to all of the hospital work in his particular field.

In addition to the full time men, arrangements have been made with certain specialists for part time duty. In the fields of endocrinology, dermatology and thoracic surgery, specialists from Binghamton hold clinic hours once or twice a week, see patients in consultation as necessary and perform whatever surgery comes within their field.

Most of our specialists started with us in the capacity of general practitioners. Then, as openings in the various specialties have occurred, the general practitioner who is thought to be best qualified is given the opportunity to go away for postgraduate study and then return to limit his practice to that particular field. Rarely the need for men in certain specialties has

been so great that it did not seem advisable to wait for the training of a man, and in those cases men already trained have been employed.

In each of the medical centers there is a complete pharmacy in charge of licensed pharmacists who issue medicines only on prescription. We have no routine procedures; each physician is allowed to treat his patients as he deems proper.

In those cases requiring special care beyond that of our own staff, the patients are sent to medical centers in New York City, Boston, Baltimore, Philadelphia or wherever necessary to obtain the services which we feel are essential for that particular case. All the expenses of such care—physicians' fees, hospital care, railroad expenses and so on—are paid for by the corporation.

Most of the patients who are hospitalized are sent to the C. S. Wilson Memorial Hospital of Johnson City. This hospital was started by Dr. Wilson with the aid of the Endicott-Johnson corporation. On his death, the estate did not feel that it could continue the hospital, so the company purchased Dr. Wilson's interest and then deeded the hospital to a board of managers as a community hospital. Occasionally, in an emergency, patients are admitted to Ideal Hospital, the village owned hospital of the village of Endicott. In such cases the company pays the hospital the usual hospital rates.

When it becomes necessary to send a patient to the hospital, the physician decides what type of accommodation is necessary for the individual patient—ward, semiprivate or private room—and the medical service takes care of the entire hospital bill. If the patient desires more elaborate accommodations than the physician deems necessary, he may ask for such accommodations, and the difference in rate between the two is submitted to him as his hospital bill.

In cases requiring special nursing services, the heads of each department, medical and surgical, rule on the necessity for such services, and if they seem necessary the company pays for such special nursing service.

In addition to the medical department, there is a voluntary sick relief association to which the employee may contribute 25 cents weekly. In case of illness which compels him to remain away from work for more than one week, he is entitled to draw "sick relief" of \$12 weekly for ten weeks. In cases in which the disability lasts more than ten weeks, the company frequently extends relief payments for a longer period of time, depending on the individual case need. No definite pension rate has been established, but each case is considered individually and the general principle has been for the company to supplement any social security payments which the individual may receive with sufficient funds to enable him to live without drawing on any funds which he may have been able to save.

The average cost of this medical service has been around \$48 a year for each worker. In the past two years, however, because of increased costs, drugs, supplies, hospital rates and salaries, it rose to \$57 in 1942 and to \$63 in 1943. The average cost annually per person eligible for service was around \$17 until 1942, when the rate rose to \$19 and in 1943 to \$21.

SUMMARY

An attempt has been made to give to the Endicott-Johnson workers and their dependents a complete medical service without any limitation except for the need of the patient.

The patient-physician relationship has been kept as nearly as possible the same as in private practice. He has a reasonable choice of physicians. He has access to specialists in every field. He is entitled to unlimited hospitalization. He may have unlimited amounts of laboratory, x-ray or other examinations. The entire service is free to the worker, the company assuming the whole expense as an operating cost.

MEDICAL SOCIETY PREPAYMENT PROGRAMS

LESSONS LEARNED FROM EXPERIENCE IN MASSACHUSETTS

JAMES C. McCANN, M.D.

WORCESTER, MASS.

America and our profession are caught in the toils of a cyclically recurring world crisis. In the current phase of crisis we must attempt to discern and anticipate future patterns of medical practice. Only thus can we guide inevitable readjustments into channels which will preserve the basic values and achievements of our free profession.

These challenging days confront us with new demands, three of which seem to have crystallized clearly; first, to produce and distribute, in cooperation with other properly interested agencies, good medical care across the entire face and into all segments of our nation; second, to accept the intent of the American people to transfer medical care of the indigent from its present base of professional responsibility as a charity to a community responsibility through taxation; third, to devise mechanisms which will provide the wage earning and moderate income segment of the American populace with a mode of easy access to needed medical services on a less costly basis. Voluntary prepayment programs under medical society auspices seem to promise much in this latter problem.

1. APPROACH AND OBJECTIVES

Experience has demonstrated the unwisdom of initiating a medical society prepayment program on a complete coverage basis. Nearly all plans have reverted to a partial coverage surgical-obstetric contract with x-ray allowance. Massachusetts has found such a limited contract to afford an actuarially sound experience in types of service not readily abused by unwarranted overutilization, thus protecting the venture during its infancy from serious adverse selection. Massachusetts hopes soon to extend coverage to include hospitalized medical cases; ultimately we should extend coverage to include as much of home and office care as is feasible.

2. SERVICE VS. CASH INDEMNITY

Massachusetts in common with most states has built around the service type of contract as the nub of the effort. It is available to individuals with incomes below \$2,000 a year and to families below \$2,500. Cash indemnity contracts are available above these levels. This dual approach protects a subscriber's permanent eligibility despite fluctuations of income above or below these levels by automatically transferring him from the service to the cash indemnity category and vice versa. Only a service contract for the entire family in the

Read in a panel discussion on "Variations in Industrial Medical Service Plans" before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

lower income brackets under which no extra charge is made beyond the corporation allowance for the service will give needed protection to this group.

Prior to 1942 the American Medical Association had taken no official cognizance of the fact that responsible state societies were building prepayment programs on the cornerstone of a service contract. All statements referred to cash indemnity contracts. To obviate this anomaly, Massachusetts sought and procured acceptance by the House of Delegates of the American Medical Association in 1942 of a resolution which recognized the service contract on a par with cash indemnity contracts. Despite the accomplishment, an editorial appeared in *THE JOURNAL* on Nov. 20, 1943 which disregarded this action and misleadingly stated that "the medical profession has approved . . . prepayment plans on a cash indemnity basis for meeting the costs of medical care."

3. ORGANIZATION

There are professional and legal problems in organizing a prepayment program. On the basis of the experience of Massachusetts proper enlightenment of the profession concerning the program wins adequate professional support. Sufficient committee effort, local county presentations, publication of all plans and placement of printed information in the hands of every physician secured nearly 70 per cent participation by practicing Massachusetts physicians on the basis of signed contracts within a few months time.

The Massachusetts program was established on a statewide basis with no county review. Such review leads to professional dissensions; the public mistrusts a program which disrupts local professional unity; sales forces cannot cope with the handicap of sectional nonparticipation; public relations are disturbed when subscribers find that services rendered will not be paid for in "forbidden areas"; unlimited patient access to specialists' services may be interfered with by arbitrary limitations at county lines.

Another problem relates to participating and nonparticipating physicians. Dealing only with participating physicians constitutes the morale basis of the service contract. This practice must be initiated as basic policy and rigidly adhered to from the beginning. In dealing with 35,000 subscribers over a year and a half, Massachusetts thus far has rarely paid for services by a nonparticipating physician. This decision appears to have made our service contract secure to date.

Legal aspects of organization relate to the specific form of corporate structure erected. Some states seeking professional jurisdiction over purely medical problems have gone to the extreme of creating boards of directors with physicians constituting a majority, up to three fourths or more, of the board. This deprives the board of valuable nonprofessional points of view and maximal public confidence. Massachusetts, weighing the corporate powers of voting members versus boards of directors, created a directorate composed one third of physicians, one third of subscriber representatives and one third of eminent business leaders. The executive committee of the medical society was given the voting membership of the corporation, empowered under the by-laws to elect the board of directors and change the by-laws. This voting membership of doctors has a guaranteed position as an advisory committee on strictly medical matters, since action in the medical

sphere contemplated by the directorate is reportable to the voting members thirty days prior to definitive action.

4. RELATIONS WITH BLUE CROSS

Massachusetts Medical Service established the closest contractual relations with the Blue Cross. The executive director of Blue Cross is also director of our corporation and provides administrative and sales services. This interrelationship seems reasonable on several counts: administrative costs should be significantly reduced; public acceptance of Blue Cross should be an effective *entrée* for a medical service corporation; business organizations prefer single sales approach and single payroll deduction for the joint services; sales to established Blue Cross groups should be most effectively accomplished by Blue Cross salesmen. The "should" in these statements relates to the unsettled problem of whether or not Blue Cross, even with the best of intentions, can give adequate sales time and effort to medical service contracts while seeking the highest sales volume of Blue Cross contracts.

Effective contractual coordination of medical service corporations with Blue Cross must be made in the face of divergent philosophies. Blue Cross executives favor an intimate interlocking of the directorates of the two corporations, even to the point of creating a single corporation to sell both hospital and medical service contracts. Physicians are well advised to create separate and distinct medical service corporations until the evolution of an experiment, so portentous in its bearing on our future professional destiny, is complete. Blue Cross executives do not sympathize with the profession's belief in the need of income limits for the service type of medical contract. Some Blue Cross plans are selling a cash indemnity contract of their own to supplement contract with local medical approval. A comprehensive hospitalization contract which includes payment for hospital-medical services, which appear as items on the hospital bill—pathology, anesthesia and x-ray—is contemplated by Blue Cross.

In resolving these controversial matters there should be thorough exploration of the wide area of common interests between us before we fall out over restricted areas of technical disagreement to our ultimate mutual confusion. Solutions may possibly be arrived at if discussion is based on the following premises:

1. Hospital billed medical services are delivered by practicing physicians who themselves have freely arranged their varying contractual relations with the institutions.

2. The Blue Cross and medical service corporations are strictly financial agencies entirely devoid of facilities, so that they do not distribute hospital or medical service directly per se. Therefore they should not be involved in the controversy relative to hospitals encroaching on the field of medical practice.

3. The two types of corporations seek by contracts with hospitals and physicians to take up the total cost of services rendered within restricted categories, with the understanding that no further charges will be made, thus giving the subscriber the so-called "service" coverage. Secondary financial contracts of this character by which Blue Cross seeks to take up any cost item on a hospital bill which is partly a hospital and partly a medical responsibility does not per se constitute encroachment on medical practice, provided such a secondary contract does not infringe on the terms of

the prior existing contract executed between the hospital and the physician. Since it relates to a pure financial transaction after the fact of delivery of a service, it cannot properly be construed as introducing a third party between the patient and his doctor or hospital.

4. Medical service corporations can never take up completely the entire cost of all the special medical-hospital services, because this would divert a disproportionate part of the subscriber's premium contribution intended for medical services to direct subsidy of elaborate hospital equipment, space and personnel.

5. There is a dual responsibility resident between the Blue Cross and medical service corporation to make these medical-hospital items available to the public on a service basis through a prepaid contract in the same way in which strictly hospital and strictly medical services are being made available.

6. These problems might be resolved if Blue Cross allowances for such items in hospital bills were made on three bases:

(a) Contracts should specify that allowances are for the cost of services (not for the provision or sale of the services per se).

(b) Descriptive circulars should explain that allowances paid the hospitals are to be allocated by the institutions according to existing contractual arrangements between the hospital and the physician who delivers the professional service.

(c) Safeguards should be erected against insurance stimulus to hospitalization of properly ambulatory patients who would normally be examined (say by x-ray) in the physician's office. Otherwise there will be costly and unwarranted hospitalization for ambulatory illness, with consequent aggravation of hospital crowding at the expense of private medical practice. This might well prove disastrous in the long run, because in well authenticated instances the establishment of a private laboratory by the physician has been his only means of escape from an inadequate unilaterally established contract, imposed on him by institutional shortsightedness. To jeopardize this professional "safety valve" might threaten the survival of a basic specialty in medical practice.

ACCOMPLISHMENTS

Medical society prepayment programs constitute a young movement not yet sufficiently seasoned for appraisal. There are statewide plans in sixteen states, with seven local plans in three other states. Total membership is about 1,000,000, with Michigan's 600,000 constituting over a half. Massachusetts has enrolled 34,000 persons since January 1943 based on about 15,000 contracts. Whereas Michigan's huge enrolment is 90 per cent in eighteen large industrial groups, ours is distributed through three hundred and ninety-six groups. Our largest group enrolment is 150. The average number of contracts per group is 37.6, and the average number of subscribers per group is 85. In 1944 our enrolment has averaged 68 per cent of the enrolled groups.

Massachusetts Medical Service has operated during this period entirely in the black. Selling our surgical-obstetric contract at the monthly rates of \$0.85 for the individual, \$1.65 for man and wife and \$2 for the family, we have retired our organizational expense of approximately \$5,000 and created a reserve and surplus of nearly \$35,000. Our position seems sufficiently strong, so that recently the directors deleted all exclusions relative to preexisting conditions from the subscriber's contract. We hope in the near future to make some provision for hospitalized medical care.

From our experience the financial soundness of any state society program will be related in general to

several items: first, the adequacy of the premium structure as related to the services offered and the compensation to the physician; second, the utilization rate by the subscriber, which will be determined by (a) the seasoning or elimination of preexisting surgical needs by prior Blue Cross or other insurance coverage and (b) the level of professional-public health-hospital services which determine the legacy of medical liabilities confronting the new corporation; third, the proper discharge of responsibility by the directors in adequately balancing the premium rates, administrative costs and contract benefits; and, fourth, adherence to a fixed schedule of allowances to physicians for standard services so that a solid actuarial experience may be evolved.

This short experience in Massachusetts suggests the promising value of a medical society prepayment program for the following reasons:

1. Because it is based on acceptance of a responsibility by the producers of medical service, who are guided by a code of high ideals and ethics and who usually exhibit an adequate sense of social and community responsibility.

2. Because it provides a pattern which can be made universally applicable in urban and rural areas, over short or wide distances, in large and small communities, in larger or smaller business units, in upper or lower income groups, the indigent and special governmental groups.

3. Because it creates a mechanism whereby medical care on a service basis can be provided for that income segment of the population in need of such protection without disrupting medical freedom, relations and establishments.

4. Because it encompasses such controversial medical modes as group practice versus individual practice and fee for service versus salary compensation, neutralizing this potent principle of prepayment with reference to each until these problems are resolved in the normal competitive evolution of medical practice.

5. Because it best safeguards the freedoms inherent in our American system of medical practice during this tragic interlude in which our republic must resolve its epic dilemma—whether to continue as a free enterprise, individualist society or to shift to a preponderantly socialistic, authoritarian type of state.

6. Because, if the former choice is happily made, medicine can adapt itself to current evolutionary change in democracy. A change by which community or governmental responsibility and enterprise on a federal-local basis shift from laissez-faire inactivity to that of umpire in cooperative efforts between the community and those free enterprise groups which exhibit the following three marks: (1) self-imposed discipline by the individuals who compose economic groups as far as group social responsibility is concerned, (2) acceptance in full measure by the group of its entire social responsibility as determined by community needs and welfare, and on a basis acceptable to the community, and (3) group cooperation with all rightfully interested agencies, whether governmental or private, in adequately meeting community needs. Selfish, indifferent or irresponsible groups will lose all right to free enterprise by default, and complete governmental action will supervene. To this current phase of our evolutionary democracy, medicine must pay heed!

St. Vincent Hospital.

VARIATIONS IN CURRENT INDUSTRIAL
MEDICAL SERVICE PLANS

JOHN J. WITTMER, M.D.

NEW YORK

None of us are afraid of ghosts. Our scientific training and intellect does not permit us to give credence to tales of preternatural caterwauling or mistlike apparitions. As children we all listened to or read ghost stories, with the usual glandular reactions, but have long since learned that all such evidences of abnormal psychology can be "laid by the heels" by the application of a little practical logic.

I am going to present a practical method by which we of the medical profession can banish the ghost which has haunted American medicine for so many years—can, in the traditional manner, drive a stake through the heart of government controlled medicine and silence forever its oft repeated threat to the traditional control of medical practice by the profession itself.

This specter of government control has not suddenly appeared on the horizon but has been gradually materializing, disguised as a panacea, for many years. In the past, opposition has been able to force it to retire into the background, but on each occasion of its resurgence it has been able to loom a little higher, until now not only has its head appeared but also most of its body. How much longer will it take for the legs to appear and for the apparition to materialize into a living Frankenstein, able to walk among us and become the potent, dominating factor in our work and our lives? I myself can already see the embryonic legs taking form.

We will not get rid of this specter by calling it base names, by proclaiming that it is unworthy and debasing or by hacking at it at random. It would seem that the more it is hacked the faster and stronger its limbs grow back again.

I think most of us must realize that the only way that we can stifle the growth of this being is to create an acceptable entity of its own kind having its own weapons—one which will not only take its place but will so far outshine it that the apparition will vanish in the brilliance of the plan of our creation. In terms of military strategy, our best defense is a vigorous offense!

I honestly and implicitly believe that the present trend toward socialized medicine can be completely "outshone" by a properly and strategically worked out plan of voluntary health insurance. Not health insurance that covers only part of sickness but an all out plan which completely and comprehensively covers all phases of illness and health—a plan which will have a budgetary basis that will insure an income commensurate with the doctor's education, qualifications, maintenance of social level and the vast expenditure of time and energy and yet not be so costly that it will be beyond the average subscriber's financial reach; health insurance that includes the medical fraternity as administrators. I believe a plan can be worked out along these lines which would nullify any inherent paradox which some may claim exists in the situation, would be attractive to the layman and would benefit our profession immeasurably by comparison with government control.

I need not point out that the poor receive excellent medical help from our profession at little or no cost and that the rich can afford to obtain any medical aid which they desire. The middle class individual, with his constant current economic demands, is neither so poor that he can obtain free aid nor wealthy enough to stand the rich man's prices. However, we have all noticed a trend toward an ever expanding group of so-called "indigent people" which includes many middle class people who, we know but cannot readily prove, can really afford to pay moderate medical fees. There is no doubt in my mind that many people admitted to charitable institutions and municipal hospitals could probably afford to pay all and could certainly pay part of their medical costs. We, as doctors, are aiding the expansion of this group of "tailor made mendicants" by continuing to donate of our services to those "indigents" who are undeserving.

My opinion is that that no one who has any income whatever should be allowed to obtain free medical aid. He should pay in proportion to his income, no matter how small the income may be. However, medical catastrophes do not come in 98 cent bits. Reasonable charges sometimes amount to hundreds of dollars. The \$25 a week man never has a hundred dollars—at least for this purpose. He does, however, have 50 cents a week that he could contribute as his share—a share that in time cannot help but make up the hundred dollars.

Generally speaking, the "great" middle class deserve a break when they are faced with illness or injury. If they are allowed to work out prepayment medical plans, each will contribute his share and, for a change, the medical profession will be paid for all services rendered, except to the genuinely poor.

Many years ago in the Consolidated Edison Company we realized that we had a very large group of employees who did not have the wherewithal to finance expensive operations or protracted treatments but who could afford to contribute something regularly each week toward their medical care. Many times we advised employees to have tonsils removed because we felt that they were the focus of infection for generalized arthritis, to have abscessed teeth extracted for the same reason, to obtain x-rays or other laboratory data required for proper diagnosis—only to hear them say, truthfully, "That's fine, but where am I going to get the money?" At that time the average income of our workers was as high as and probably higher than the income of workers in most industries, but about the only thing we could do was to try to arrange with some semicharitable or city institution to have the work done with no, or at least very little, expense to the employee. You know that this condition exists in all communities. Who has been doing this free work? You doctors sitting here before me today!

We of the Consolidated Edison Company of New York, Inc., saw a solution of the problem when the rank and file workers—those earning less than \$3,000 a year, asked permission to form a mutual aid association. The entire arrangement was voluntary. A worker had absolute free choice of joining the organization. As a member he paid five ninths of 1 per cent of his weekly salary, which averages about 22 cents a week. The company felt that it would gain enough from the experiment to match the weekly contribution of the employee. For this contribution the employee was eligible to obtain a total medical and a basic dental service. The doctors and dentists were provided on

a restricted basis, which is to say that a group of doctors was selected to work on such a part time basis as was felt to be adequate to take care of the illnesses of all the subscribers. By "part time" I mean that enough potential work is available to occupy the doctor for about a third to a half of his working hours. Members are allowed to select any one of the doctors on the group whom they choose. The same system applies to the dentists.

Of course it follows that within a short time one doctor has more work to do than another. This naturally occurs according to the interest and sincerity which the doctor puts into his work, and, because the doctors are paid on a fee basis, competition is keen. When necessary, members are free to choose specialists who cover all phases of consultant medical work and who also are in the group.

Our entire medical service is under the absolute authority of a medical director and his assistants, all physicians and surgeons in good standing. The medical staff includes physicians, surgeons, dentists, nurses, pharmacists and a masseuse, besides the clerical staff needed, all except the last being on a fee or retainer basis. In addition, physicians attached to various hospitals treat our employees and receive payment on a fee basis for their services.

The medical services available are:

1. Physical examinations before transfer, retirement or for special reasons.
2. Periodic examinations, including those for certain types of workers, such as men engaged in hazardous occupations.
3. Examinations requested by employees.
4. Examinations prior to return to duty, including routine fluoroscopy.
5. First aid for injuries or illness on the job.
6. Treatment for illness, either in one of the medical bureau offices, at a physician's private office, or at home.
7. The furnishing of prescribed drugs.
8. Diagnosis and treatments by specialists.
9. Extensive x-ray and laboratory facilities.
10. Cooperation with employees' personal physicians in cases in which the employee still chooses to have his personal physician, and advice on home medical problems.
11. Physical therapy service under the direction of a physician.
12. Dental diagnosis, treatments and restoration work.
13. Operations, medical treatments and other services in hospitals.
14. The facilities of a convalescent home under medical supervision.

During the time that our medical service has been in operation, our observations and personnel statistics have indicated a decided improvement in health conditions in a working force that now approximates 25,000 employees. Serious chronic illnesses, such as tuberculosis, cardiovascular disease and those due to toxic poisoning, have been reduced greatly. Our doctors rarely find the deplorable cases of neglect of teeth, mouth, throat, alimentary canal and the degenerative conditions due to tonsils or other foci of infection. Our absentee rate is well below the national average.

Our medical services are extensive, and the employees use them freely but, consisting as they do of essentials only, the services are not a tremendous burden financially either to the employees or to the company. All the services outlined can be obtained at a total cost

for each employee of approximately \$22 annually. Since employees contribute to the cost of the medical service, they feel that it is theirs to use, and both the management and the employees benefit by a sounder, healthier body of workers.

The question naturally arises What are the advantages of such a program?

Let me list them:

I. Every employee in the middle and lower income brackets is paying his way when he is ill. We do not have employees who are being treated in charitable or other free institutions. I really believe that a third to a half of present medical mendicants can be changed to paying clients by a prepayment medical plan.

II. The doctor's income is higher. He is receiving an actual income for the actual work he does. There are no debtors on his books. In addition, he is receiving pay for work that he formerly performed for nothing.

III. In all these plans there is money available for research and prevention. This money is available as part of current expense and can be used in ways that are deemed most feasible by the medical fraternity.

IV. As all aids of x-ray laboratory and other diagnostic facilities are available without monetary restraint, an immediate and reasonably certain diagnosis can be made. Not only is this a gratifying reward in the practice of medicine, but the patient is that much sooner available for efficient productivity in industry.

V. Patients will seek medical help earlier in the disease and in some cases more often. Early diagnosis, concentrated treatment, unlimited facilities and freedom of action allow the doctor to get more patients well much more rapidly.

VI. By exercising all methods of prevention, immediate and comprehensive diagnosis and concentrated treatment, we feel that our absence rate is about one half of that of the average industrial worker. This, of course, helps industry, but what helps industry helps the community and cannot but be an asset to the country as a whole. In addition, the employees are perfectly satisfied with this program and, I firmly believe, would vigorously oppose any other plan. The only dissatisfaction that exists is that we have not included the members of the family.

VII. Constant check-up of employees reveals many hidden conditions which, while not totally incapacitating, do retard their efficiency. Correcting these conditions in their infancy is prophylaxis against present loss of ability to produce and future lost time.

In conclusion let me leave this thought with you. If voluntary health insurance in the form I have described is worth while, and I sincerely believe it is, it should be adopted wholeheartedly by the profession. I do not believe that we shall get anywhere by watching small experiments proceeding in a few isolated areas. The present problem calls for prompt action: action to proceed with these plans in an extensive, organized manner; large plans that cover many people in many places. Let us beware that while we are too carefully and slowly scrutinizing what seems to be a real answer to our problem we might have saddled on us this "specter," this more radical substitute which has taken hold and which, as legislation, would have to be accepted "whole hog."

Let us, as the caretakers and guardians of the health of the American people, work out a "modern way" of

medical care for all our people with due consideration for their financial resources, with adequate provision for their proper care, with provision for an adequate income for the doctor and, last but not least, with a view toward preserving the dignity of our profession. This is our precept, our prerogative and our duty.

4 Irving Place.

QUESTION AND ANSWER PERIOD

ON PANEL DISCUSSION ON VARIATIONS IN INDUSTRIAL MEDICAL SERVICE PLANS

Question.—What is the attitude of the local profession to the association?

DR. JAMES M. ADAMS, New York: At the time the association was organized there was passive resistance on the part of the local medical profession which a few years later became active; however, I am pleased to say this has entirely vanished now and the association is recognized as a part of the medical life of that community.

DR. M. S. BLOOM, Binghamton, N. Y.: The plans have been set up with complete freedom of choice. They have never been set up in any community without first taking it up with the economics committee of the county medical society. The doctors have welcomed the plans. Recently, before care for dependents was added to the Anso plan, I had meetings with the surgeons and the eye, ear, nose and throat specialists saying that, if they were willing to cooperate as they had with the employees, we would put it to a vote of the employees. The doctors agreed, the vote was taken, and care for dependents was added to the benefits of the Anso plan.

Question.—How did the unions feel toward the prepayment medical plans?

DR. BLOOM: Very well. Some of the plans were in operation before the union was established, and the unions insisted in their contract that the plans be continued as before.

Question.—Will the long term instability of industrial units and of employment restrict the value of industrial units as a base on which to build medical care?

DR. JAMES C. McCANN, Worcester, Mass.: My reaction is based on living in the oldest industrial section in the nation, New England. I live in Massachusetts, which was once the heart of the shoe industry and the cotton industry but is so no longer. I came from Maine, which was the heart of shipbuilding, but Maine has lost out to the Pacific coast. So there is a tremendous instability in industry, if we look at it from the point of view of constructing the medical care of the American people around that base. Mr. Henry Kaiser became interested in this problem, and he did establish a prepaid medical group on the West Coast. As president of Brewster he didn't. Since Brewster has just lost its contract for the construction of the Corsair airplane, since it is estimated that if the airplane industry will continue at 20 per cent of its present productive capacity in peacetime it will be fortunate, I wonder how stable that is as a long term base for revising the distribution of medical care. I know that key figures in major industries in New England are totally unwilling to become involved in this problem. Most do not want to become involved in any step encroaching on the tremendous problem of local medical care.

Question.—Would the long term instability of industrial units and of employment restrict the value of industrial units as a base on which to build medical care?

DR. JOHN J. WITTMER, New York: Industry isn't in the mood to take over this medical plan. Industry wants the community to do it and I myself feel that it is a community problem and that the community itself should organize to do it. The only reason industry has gone ahead on the present basis is that the community and other sources have not solved the problem and industry was forced to do it.

DR. STONEY R. GARFIELD, Oakland, Calif.: Mr. Kaiser and I both feel that medical care should be on a community basis. The plan we propose that the medical societies should operate, utilizing the principles we think are sound in operation, should

supply not only industry but the community—the Lions Club, the Women's Club, the farmers' cooperatives—every organization possible that can arrange for collections of dues.

Question.—Why do you use a three thousand dollar limit for employees who join your plan?

Question.—Is a \$2,000 to \$3,000 income ceiling necessary?

Question.—You mentioned five ninths of 1 per cent by employer and employee as a contribution to support the service. Is there any top limit of earning beyond which the percentage does not apply?

DR. WITTMER: We decided on the \$3,000 limit as a method of expediency backed by practical experience. The reason we said \$3,000 in the beginning of our plan is that we have two methods of payroll payment: Those who receive less than \$3,000 a year are on a weekly payroll, those who receive \$3,000 or more are on a monthly payroll, and it was much easier to draw the line and say those on one side should be members of the plan and those on the other side would not. In addition is the fact that the average man who gets to \$3,000 in the non-war-time period is usually an older man, 45, 50, 55, and usually he has reached the height of his family experience. He already has his two, three, four, five and six children. The man of the lower income bracket in quite a few instances doesn't have quite as many children. In interviewing these various individuals we found from the level of their living that they needed more money than the laborer would who is earning \$2,000 a year. We found that our loan ratio was much higher in the \$2,500 to \$4,000 group, that those were the people who really were borrowing money. We think \$3,000 is certainly the lowest level of payroll that should be used as a ceiling. The question on five ninths of 1 per cent—that sounds rather ambiguous—but if a man is earning \$27 a week he pays about 15 cents a week; if he was earning \$18 a week he would pay something like 10 cents a week. When he gets into the \$40 to \$45 group he still pays his five ninths of 1 per cent, which, of course, is actually more in that it is the same percentage of a higher amount of money.

DR. McCANN: We established \$2,500 in Massachusetts. We found out afterward from union men on our board that \$3,000, roughly, draws the line of demarcation between the working group and management, and that if one has an income limit below that one would be asking the union by supporting it to introduce a factor of apparent discrimination in approaching the workmen.

Question.—Is there a tendency on the part of attending physicians to charge in addition to the amount allowed by the plan?

DR. BLOOM: Only occasionally do physicians outside the direct localities charge fees higher than those allowed. We are paying bills to physicians throughout the United States. We pay the allowance, and the patient pays the difference. The executives in the various companies are included in the plans. We don't expect the doctors to charge consistently the fees outlined for the workers.

DR. ADAMS: We have a number of plans in our company that were based on the plan outlined by Dr. Bloom. Most of those have a maximum for surgical operations of around \$150, and the surgeon's fee is usually paid up to that amount; also set fees for house visits and office calls, and in most of the communities where these organizations operate we find that the charges of the physicians are seldom greater than those allowed by the association.

Question.—Is absence or sickness rate lowered as a result of the plan?

DR. ADAMS: I don't have the figures, but I can say in a general way that my close association with the Stanocola plan was in its early stages and at that time we did notice a definite drop in the sickness rate after the inauguration of the plan. Whether this was a direct result of the operation of the plan I am unable to say.

DR. BLOOM: Yes. Under the Anso plan we had a gradual drop over a period of eight years. Less sick relief was drawn each year. We have no way of determining from the Mutual Benefit Association's data absenteeism for less than seven days. I should like to give the exact figures on sick benefits from

1934, when the average amount drawn annually per member was \$3.75. This amount gradually decreased until 1940, when the amount drawn was \$1.41 annually per member.

DR. WILLIAM A. SAWYER, Rochester, N. Y.: Per employee?

DR. BLOOM: Yes.

DR. WITTMER: I can say definitely that it is lowered in our plan to about half of the national average in spite of the fact that we have a liberal sickness payment plan. A man is entitled in any current year to one week's full time pay for each year that he has worked and after that period has expired receives twenty-six weeks in any current year from his mutual aid society at 80 per cent; in other words, if a man has been working for the company for twenty-six years he is allowed when ill twenty-six weeks' full pay, twenty-six weeks' mutual aid at 80 per cent.

DR. EDWARD M. JONES, Johnson City, N. Y.: Such figures are difficult to interpret because of the many factors involved. Although I have no statistics on our plan, I doubt whether it makes any difference in the absence rate from work. One important factor, particularly when women workers are involved, is the approximation of the sick relief rate to their weekly wage. During the years mentioned by Dr. Bloom this is a factor to consider.

DR. BLOOM: Our experience in the shoe industry shows that absence or sickness was reduced during the depression because people were afraid of losing their jobs. Our sick benefits were much lower then than during other times.

Question.—How are the doctors paid under the Consolidated Edison plan?

DR. WITTMER: The doctors are paid on a fee basis for each call they make. They make a report on each call, and a record is kept for monthly payments.

Question.—How can one give complete care to needy people without taxation carrying the load?

DR. GARFIELD: A certain proportion of the weekly fee can be set aside for the particular purpose; in other words, we have been able to do a certain amount of work for the needy. Right now, when there is full employment, one could have 5 cents a week set aside for medical care if they are later unemployed. The other way of handling it would be through the Social Security system, where the Social Security-setup would pay the fee per week of the person who is unemployed.

Question.—What difficulty has been encountered in a fee basis plan of too much medical care, needless surgery, and the like?

Question.—What limitations as to length of disability should be imposed on disability based on psychosomatic disturbances?

DR. BLOOM: There is always a certain small percentage of employees who will do a lot of shopping around and who will go to doctors whether they belong to prepayment organizations or not. We have found that where there are certain limitations to what the employee is entitled to (and I think the plans I have suggested are rather comprehensive) we do not find that the employees exceed the limitations imposed very often. As Dr. Garfield said on the question of diminishing returns, with the new methods of treatment the number of days' hospitalization will be reduced. Where we have a limitation of hospitalization and of calls, the patients exercise judgment in order to maintain a reserve just as anybody with a certain amount of money in the savings bank exercises judgment and caution.

DR. GARFIELD: We have no particular problem on this point, since all our physicians are on a budgeted income. There is no possibility of overtreatment. They just treat a patient as much as necessary. We have quite a lot of psychosomatic disturbances, which we handle in the usual manner, with psychiatrists, and it isn't a major problem. We have found that hospitalization under our plan really increases; however, it is for minor conditions rather than major ones. It is for a shorter period of time and as a result ends up in being less costly to the organization.

Question.—In actual experience many acute illnesses rarely last two weeks unless complications ensue. It would seem that elimination of the seven to ten days is an element of weakness from the point of view of prevention. Why not have full coverage under the prepayment plan?

DR. WITTMER: I think this question has been misdirected, because we have full coverage. I believe in total coverage not only of the medical service but for the absence. A man who is sick can't get well quickly if he realizes that he is getting \$12 a week rather than his usual \$40 a week. I think paying him his regular salary from the day he is absent keeps his morale high. I don't believe there should be any limitation on medical service. I don't know what these people would do if you should say you would take care of them for twenty-one days or for \$150 worth. At the end of that period, if they really were still ill, they would be up against it just as much as in the beginning. I think that most of the limitations on coverage are in the line of policing, and restriction on service is the poorest kind of policing I know of.

THE CHAIRMAN: I think this question has to do with the rather general policy of a waiting period. One of the speakers mentioned a waiting period of several months, I think, or that the patient had to be employed several months before he became a beneficiary of the plan. The questioner probably had that rather general principle in mind.

DR. BLOOM: It has been the policy for years to pay sick relief only after the first seven days' illness. It must be remembered that the employees themselves draw up these rules and regulations. They feel that it would not be fair otherwise. The purpose of the mutual benefit associations is primarily to provide medical care and to relieve the worker of worry. Medical care is provided whenever the employee desires it.

DR. ADAMS: Our company has preemployment examinations, and in the prewar time any person who applied for membership in the Stanocola Association immediately when he was employed by the company had a waiting period of sixty days. He had to pay dues for two months, in other words, before he could receive the benefits. Since there has been the shortage of doctors in the war period and so many transient workers coming and going, every one is made to wait a year now before he can apply for membership.

Question.—Should any distinction in fees be made to provide incentive for good medical care?

DR. GARFIELD: I don't think I am the proper one to discuss that. We don't work on a fee for service basis.

THE CHAIRMAN: In other words, you don't think it necessary?

DR. GARFIELD: I think the fee for service basis is definitely wrong in caring for medical needs of the people.

DR. BLOOM: If the fees are high enough and suitable to the leading physicians in the community, there should not be any trouble getting the outstanding men in the community to do the work.

Question.—Do employees object to percentage premium payment, that is, the higher brackets pay more than the smaller?

DR. BLOOM: I think I am the only one who has that system. Our members pay 15, 20 and 25 cents a week. Dues are determined by wage scale. This includes cash benefits also. Members cannot join a group higher than their wage level. If there are members who belong to other organizations that pay sick benefits, it has a tendency to encourage malingering. We seldom have difficulty on the question of sick benefits for male workers.

DR. WITTMER: We have the percentage, five ninths of 1 per cent, deduction plan. We have 99 and a fraction per cent of our employees eligible in the plan. This is an absolutely voluntary plan. In the last fifteen years I have never heard any reaction against the variation of deductions.

DR. DEAN A. CLARK, U. S. P. H. S., Washington, D. C.: There is no question in any of our minds that the executives and participants in these successful plans deserve not only our respect but our heartiest congratulations. Nevertheless there are some problems raised by our chairman's address yesterday and by some of the problems implicit in what was said today that are not answered or perhaps cannot be answered by such plans as these. For instance, all the speakers, I believe, spoke in general terms implying that this type of plan might solve the medical care problem for the United States. Then various groups were discussed separately, such as the indigent, the chronically sick, the aged, psychiatric cases. We heard from

our chairman yesterday of the problems of the rural areas, poor states and the regions that under almost no conceivable circumstances could finance their own medical care. And yet all the speakers favor a community type of plan. How could it be conceivable that on a community plan basis, and by "community" it might mean a city, a county, a state or the nation, such medical service plans could care for all our medical problems without taxation and necessarily federal tax aid?

DR GARFIELD. The Kaiser plan would not solve the problem of medical care completely, however it would so nearly do so that the problems not taken care of, such as indigent medical care, could be handled easily through community support. In California if there was a statewide plan operated on the same basis as ours there would be sufficient funds developed within the plan itself to take care of indigents in this state. There may be some states where there is not a sufficient concentration of people to build up funds through such a plan to take care of the indigent and unemployed. In these exceptional instances government help through tax contributed funds may be thoroughly justified. I don't think government intervention is justified or desired if we can do the job ourselves.

DR FRANCIS M. POTTINGER, Monrovia, Calif. The industrial service plans discussed in this panel are attempting to solve medical problems which affect the efficiency of industrial workers in individual organizations. However, the medical profession today is confronted not by a limited but by a general situation which calls for a complete medical service providing both prevention and treatment for all the people. The experience of limited groups is valuable, but the Massachusetts plan is an attack on the problem which is interesting the medical profession as a whole. Any satisfactory plan must be applicable to conditions of both full and limited employment and also to those of unemployment. It must be suited to the income which the people may receive under all working conditions. It must furnish services not only to workers in large industrial organizations but to all others with small incomes. An important though insufficiently recognized factor in precipitating the medical problem in the last decade is the rapid industrialization which has taken place during the twentieth century requiring the moving of the workers from the country to the city. In 1900 30 per cent of the people lived in the cities. By 1930 this had been increased to 50 per cent. In the country the worker could raise much of his own food, but the city dweller loses his independence by the transfer and is obliged to spend far more for his maintenance than the rural worker, and when he loses employment he is unable to maintain himself and his family. In times of full employment unpredictable illness is hard for the workers to meet and in times of unemployment it is all but impossible. The medical profession has long assumed what is rightly the government's obligation: the care for those of low income and no income. It is an injustice that it should carry this burden, for the preparation for the practice of medicine today requires a large outlay for which the physician deserves adequate return. Furthermore, today's practice, with its laboratories and technicians, is carried out at a cost which the physician cannot absorb in a fee that the average family can pay. In solving this problem the medical profession fears governmental control of medical practice. At the same time there is no way in which it can furnish adequate care to low income families except as charity or through taxation. The objection to governmental control might be overcome by the adoption of a three point program: (1) private practice, (2) voluntary insurance, (3) care for the remaining portion of the population through general taxation. In this plan the medical association could enter into contract with the state to supply the needed care and so would control medical practice and become a more efficient force in the prevention of disease. The government would meet the bills, being held responsible as it should be, for the solution of society's problem. The two together could provide adequate working arrangements and would be responsible for their efficacy.

DR KINGSTON ROBERTS, New York. I believe that we have heard many things that emphasize the importance of bringing community administration into closer contact with the employer sponsored plans because, by the mutuality of interests, the problems raised about the care of the lower income groups become

community problems, and since the management is also on the administration it becomes something that the community and management can learn to try to work out. I think we can realize from what has been said the great need for more data and more statistics to show just what an active health conservation and preventive medical program, in conjunction with these industrial plans, can mean in terms of dollars and cents. When I go to some one like Dr. Garfield and say that I believe one should spend more time in lessening the incidence and severity of disease I would like to be able to pull out of my pocket a ledger which will show Dr. Garfield and Mr. Kaiser and Endicott-Johnson and anybody else that by spending money we are lessening the incidence and severity of disease and that by so doing they will ultimately save money for their plans.

DR CHARLES V. CRASTER, Newark, N. J. In Newark for a number of years we had a plan whereby the indigent poor and the near poor were taken care of by a group of physicians who were paid an annual salary. There was so much abuse and so much discontent and various other difficulties in connection with such work that we decided to change, and by arrangement with the state medical society we now have a plan whereby the indigent poor and the medically indigent, as they are called, the lower salary groups, will be taken care of by the city on a payment plan which is much the same as that received by the doctors in their private practice. The indigent poor and the medically poor are allowed to make their own free choice of physicians, and the city will pay the fee of these physicians. Of course, the indigent poor are given the service entirely free, but the medically poor are investigated by the welfare department and where they are found to be able to pay some part of the fees they are billed for that amount. The plan has been in operation only for the last six months, but so far we feel that it is giving us the answer to a condition which has been troublesome for a number of years.

DR DAVID A. MCCOY, Boston. I was disappointed in the role of preventive medicine in these particular plans. Organized medical control measures are necessary in any industrial plant not only to serve as a stopgap against occupational disease but also to offer a formidable barrier against the nonoccupational diseases which cause so much absenteeism. I don't think any program either locally or nationally will be successful unless this particular branch of the program is developed.

DR C. RUFUS ROREM, Chicago. I am director of the Blue Cross Hospital Service Plan Commission. The commission, which is part of the American Hospital Association, has been collecting data on the administration and particularly the administrative operation of the medical plans. It was done with some reluctance, because we felt it was not particularly the province of the Hospital Association to explore this field, but the plans were looking for groups which had facilities and some experience to do this. Dr. Wittmer did not say so, but I think we can take it for granted that, although people pay different sums into the operation of the mutual benefit association, the amounts paid on their behalf to doctors are identical. As far as the medical profession is concerned, the payments received on behalf of the low income subscribers are the same as for others. The practice of establishing an income level of \$3,000 in Social Security legislation has been based on the theory that the balance will be made up from some sort of general taxes. There could be a uniform percentage applied to all income groups, even up to \$10,000 (which is, for statistical purposes, the top limit of earnings in the United States), and down to zero. But such a procedure would need to be universal.

DR McCANN. We must not allow the unchallenged assumption that all the problems of medicine are related to reorganizing the profession on a group basis to pass as valid. That is begging the whole question. I was trained at the Mayo Clinic. I know its values. I practiced group medicine for several years after I left. I am now practicing on my own. I have equal devotion to the individual physician practicing by himself. There are fields for both modes of practice. The men who have been long in the practice of group medicine do not say that the whole profession should be reorganized on a group basis. Some say that the base of medical practice is the general practitioner. I think there will be major important diagnostic centers for reference work through the nation but I think the

backbone of American practice will continue to be the individual practitioner in the community and in the segment of the community where he is immediately available to the family. With regard to preventive medical service, if early diagnosis and early treatment will be stimulated by these methods we are contributing to preventive medicine.

DR ADAMS. The discussion this morning has been limited to industrial and state plans, but there are several other types of plans which may have more universal application than any of these. First probably would come the plans organized and sponsored by physicians themselves, some of which are operating successfully throughout the country, and then other state-wide medical association plans such as in the state of New Jersey. Third are the commercial insurance plans, of which there are many, one of which is operating satisfactorily in our company. Their rates are considerably higher than in our employee organizations, but they are an answer in some states where employee organizations are not permitted.

THE THERAPEUTIC EFFECT OF PARA-AMINO BENZOIC ACID IN LOUSE BORNE TYPHUS FEVER

LIEUTENANT COMMANDER ANDREW YEOMANS
(MC), U.S.N.R.

LIEUTENANT COLONEL J. C. SNYDER
MEDICAL CORPS, ARMY OF THE UNITED STATES

MAJOR E. S. MURRAY
MEDICAL CORPS, ARMY OF THE UNITED STATES

CAPTAIN C. J. D. ZARAFONETIS
MEDICAL CORPS, ARMY OF THE UNITED STATES
AND

MAJOR R. S. ECKE
MEDICAL CORPS, ARMY OF THE UNITED STATES

Many efforts have been made to find a substance of therapeutic value in typhus fever. The papers in the literature which cite the effects of various agents have been discussed in a recent editorial.¹ It is our purpose in this report to present the results of the treatment of classic epidemic louse borne typhus fever with para-aminobenzoic acid.

The possible therapeutic value of para-aminobenzoic acid was suggested by Snyder, Maier and Anderson,² who reported that the mortality of experimental murine typhus in white mice was reduced by the oral administration of the drug. In their experiments approximately 80 per cent of the untreated control mice died of murine typhus after intraperitoneal inoculation of infected yolk sac suspensions (Wilmington strain),³ whereas more than four fifths of the mice which were

fed on a ration containing para-aminobenzoic acid survived the same infecting dose of yolk sac. Even when the oral administration of para-aminobenzoic acid was started one or two days after the inoculation of rickettsias, there was a difference between the treated and the control groups.⁴ Although large amounts of para-aminobenzoic acid were required to demonstrate this effect, the results were sufficiently encouraging to stimulate the clinical trial of the drug, which has been undertaken in the United States of America Typhus Commission ward at the Fever Hospital, Cairo, Egypt.⁵ After the clinical study was in progress we received other reports which extended the observations of the effect of para-aminobenzoic acid in experimental typhus. Andrewes, King and van den Ende,⁶ in testing a large number of compounds, observed a slight effect when maximal doses of para-aminobenzoic acid were given to mice infected by the intranasal route. Hamilton, Plotz and Smadel⁷ noted a definite inhibitory effect of high concentrations of para-aminobenzoic acid on the growth of typhus rickettsias in the yolk sac membrane of developing chick embryos. The results of the experimental work cited are in agreement with the clinical observations which form the basis of this report.

CLINICAL STUDY OF TYPHUS FEVER IN EGYPT

Through the courtesy of the Egyptian officials, the United States of America Typhus Commission established an experimental ward in the Cairo Fever Hospital early in 1943, at the beginning of one of the most severe epidemics of typhus which Egypt has experienced. More than 2,000 cases were admitted to the Fever Hospital in May 1943 at the peak of the outbreak. Although the epidemic was less extensive in 1944, there was an excellent opportunity throughout both seasons to study the clinical aspects of the disease.

In order to provide a background for the evaluation of para-aminobenzoic acid therapy, the experience with louse borne typhus cases in 1943 and 1944 is reviewed briefly. All the cases discussed in this report were considered to be certain cases of typhus fever on the basis of clinical evidence. The diagnosis in nearly every instance was supported by definite laboratory results (rise in titer of Weil-Felix and complement fixation tests). In some cases the direct isolation of rickettsias was successful either from blood or from lice fed on the patients during the febrile period. All the strains which have been isolated from patients in the Commission ward have exhibited the characteristics of typical louse borne typhus both in 1943⁸ and in 1944.⁹

During the two seasons, 159 patients with typhus were admitted to the Commission ward. Of this number there were 44 patients who may be compared with the cases in the treated series, in that they were unvaccinated Egyptian males between the ages of 18 and 48, who entered the ward before the end of the seventh day of illness. They received no therapy other than nursing

From the United States of America Typhus Commission Unit at the Fever Hospital, Cairo, Egypt.

Lieutenant Colonel Snyder is a member of the staff of the International Health Division of the Rockefeller Foundation, on leave.

The supplies of para-aminobenzoic acid were made available by the International Health Division of the Rockefeller Foundation and Dr. Herald R. Cox (Lederle Laboratories).

The authors received generous cooperation from the officials of the Egyptian Ministry of Public Health, who facilitated the studies of the United States of America Typhus Commission in Egypt.

The director of the Cairo Fever Hospital, Dr. M. A. B. Demerdash Bey, made possible the establishment of the United States of America Typhus Commission ward and laboratory in his institution. His extensive experience with typhus, his continued interest in the work and his helpful advice and cooperation were of the greatest value.

In 1943 numerous chemical determinations for the cases in this study were performed in the 35th General Hospital laboratory staff.

In 1943 most of the serologic tests for the commission ward were performed by Col. Harry Plotz, M. C., A. U. S., and Capt. B. L. Bennett, Sn. C., A. U. S., with the technical assistance of Sergeant Guin.

Technical assistance was given by Sergeants Stephens and Dworkowitz and Corporals Stearman, Hogen, Cassell and Friedberg in the laboratory work of the commission ward.

1. Chemotherapy of Murine Typhus, editorial, J. A. M. A. 125: 633 (July 1) 1944.

2. Snyder, J. C., Maier, J., and Anderson, C. R. Report to the Division of Medical Sciences, National Research Council, Dec. 26, 1942.

3. Cox, H. R. Use of Yolk Sac of Developing Chick Embryo as Medium for Growing Rickettsiae of Rocky Mountain Spotted Fever and Typhus Groups, Pub. Health Rep. 53: 2241-2247, 1938.

4. These experiments were performed in the Laboratories of the International Health Division of the Rockefeller Foundation, New York.

5. Bayne-Jones, Stanhope. The United States of America Typhus Commission, Army M. Bull. No. 68, pp. 415, July 1943.

6. Andrewes, C. H.; King, H., and van den Ende, M. A. Chemotherapeutic Agent Active Against the Rickettsiae of Typhus, British report from the National Institute for Medical Research, Hampstead, London, 1943, quoted from Hamilton, Plotz and Smadel.⁷

7. Hamilton, H. L., Plotz, H., and Smadel, J. E. Effect of p-Aminobenzoic Acid on the Growth of Typhus Rickettsiae in the Yolk Sac of the Infected Chick Embryo, report to the Director of the United States of America Typhus Commission, Dec. 16, 1943, to be published.

8. Letter of Dr. N. H. Topping to the Director of the United States of America Typhus Commission dated Nov. 6, 1943. Plotz, H., Westman, E., and Bennett, B. L. The Serological Pattern in Epidemic Typhus Fever 3. The Development of Complement Fixing Antibodies. From the Division of Virus and Rickettsial Diseases, Army Medical School, Army Medical Center, Washington, D. C., December 1943, to be published.

9. Unpublished observations of the authors.

care, fluids and appropriate measures to combat specific complications which occurred during the course of hospitalization. This group of patients is designated as the "untreated" group.

ESTIMATION OF THE SEVERITY OF ILLNESS

After discharge from the hospital each patient was classified on the basis of his clinical course. The principal factors which influenced the estimation of severity were the intensity of subjective symptoms (headache, generalized bodily aches and pains, tinnitus, deafness), the degree of prostration, the extent of central nervous system involvement (mental dulness, stupor, coma, incontinence of urine and feces, abnormal neurologic signs), the severity of cardiovascular system involvement (hypotension, tachycardia, peripheral vascular failure, myocardial damage) and finally occurrence of urinary retention, oliguria, nitrogen retention, bronchopneumonia, otitis media, parotitis, furunculosis and gangrene. With these factors in mind the following classification was made:

B. Cases with minimal symptoms and signs, yet definitely diagnosed as typhus on clinical evidence.

C. Cases of moderate severity, showing slight prostration, central nervous system involvement, cardiovascular changes or mild complications.

TABLE 1.—Forty-Four "Untreated" Cases of Typhus Classified According to Clinical Severity*

Number and Percentage of Cases in Each Classification				
B	C	D	E	F
1 (2%)	12 (27%)	18 (41%)	5 (11%)	8 (18%)

* Unvaccinated Egyptian males, aged 18-48 inclusive, admitted to the ward in the first week of illness. The criteria of classification are described in the text. This footnote applies also to tables 2, 3, 4 and 6.

D. Severe typhus cases with pronounced prostration, central nervous system involvement, cardiovascular changes or serious complications.

E. Cases of such severe illness that a fatal outcome was expected at some point in the clinical course.

F. Fatal cases.

SEVERITY OF "UNTREATED" TYPHUS FEVER

The classification of the 44 "untreated" cases is shown in table 1. One case was B, 12 were C, 18 were D, 5 were E and 8 were F. This distribution of severity in the 44 "untreated" cases was parallel with that encountered in the entire experience of our ward as regards unvaccinated "untreated" patients in the same age group, irrespective of the day of illness at the time of admission to the ward. The rarity of mild cases is noteworthy.

TREATMENT WITH PARA-AMINO BENZOIC ACID

Twenty cases of typhus were treated with sufficiently large amounts of para-aminobenzoic acid to produce a measurable concentration of the substance in the blood. Before arrangements were made to determine blood levels of para-aminobenzoic acid, 3 patients were given small doses which are considered as entirely inadequate in the light of subsequent studies. Those cases are not included in this report. The treated cases are considered in three groups:

Group 1. Controlled series: 10 patients received para-aminobenzoic acid while the alternate patients were given routine ward care only.

Group 2. Consecutive series: 7 patients were treated with para-aminobenzoic acid; no alternate control cases were included.

Group 3. Miscellaneous cases: a group composed of 2 patients who had been ill with typhus longer than seven days at the time treatment was begun and 1 patient, aged 70, who received para-aminobenzoic acid in the third twenty-four hours of his illness.

Selection of Patients.—The patients selected for the controlled series and the consecutive series (groups 1 and 2) were unvaccinated males between 18 and 48 years of age, who had no obvious complicating conditions at the time of admission, whose date of onset of illness was clear and who were not later in their disease than the seventh twenty-four hours.¹⁰

Fifth and sixth day cases were accepted in the study group only if it was possible to make a clinical diagnosis of typhus at the time of inclusion in the series. Earlier cases were accepted without a positive clinical diagnosis at the time of admission if relatives or close personal contacts were known to have had typhus recently. Four cases were obtained from a group of family contacts who reported to the ward daily; their onset of illness actually occurred while they were under observation.

In the controlled series the decision as to which patients would receive para-aminobenzoic acid was made automatically. Alternate patients were treated in the order in which they entered the hospital. Two exceptions to this rule occurred. The series was interrupted by error when 2 patients were treated consecutively and by arbitrary decision when a man whose wife and father both died of typhus was treated with para-aminobenzoic acid although the series required a control (case 6921).

Plan of Treatment.—In all instances para-aminobenzoic acid was administered by mouth. The initial dose varied from 4 to 8 Gm. In the majority of cases the initial dose was followed by 2 Gm. every two hours unless the concentration in the blood attained excessive values. Adjustments in dosage were made in relation to fluid intake and urinary output. The fluid intake in nearly all instances was adequate to maintain the output of urine between 1,500 and 3,000 cc. in twenty-four hours.

The effort was made to keep the concentration of para-aminobenzoic acid in the blood between 10 and 20 mg. per hundred cubic centimeters. Para-aminobenzoic acid is absorbed and excreted very rapidly, so that a two hourly schedule of administration was decided on as that most likely to produce a relatively constant blood level. Determinations made at various times during treatment indicated that the two hourly schedule was effective in maintaining a satisfactory concentration of para-aminobenzoic acid throughout the period of therapy.

Para-aminobenzoic acid was continued for varying lengths of time in the first cases. Subsequently it was decided that treatment should be continued until the patient's rectal temperature was 37.5 C. (99.5 F.) or less for twenty-four hours. The average amount of

10. The study was restricted to cases in the first week of illness for two principal reasons. The response to para-aminobenzoic acid in the first few cases was not apparent for several days. There was no abrupt, dramatic change such as that produced by sulfonamide drugs in pneumococcal pneumonia, for example. It seemed unlikely that late cases could be treated with any prospect of evaluation of results unless a very much larger group of cases could be observed than the admission ward would accommodate. Furthermore, the great majority of cases in an epidemic can be diagnosed by the end of the seventh day. This time was arbitrarily chosen, therefore, as the basis of selection of cases.

para-aminobenzoic acid for each case (groups 1 and 2) was approximately 127 Gm. The patients who are the subject of discussion in this study received para-aminobenzoic acid for at least three days.

Nausea and vomiting attributable to para-aminobenzoic acid occurred in the first few cases. Thereafter, in order to lessen gastric irritation, sufficient sodium bicarbonate was given to neutralize the para-aminobenzoic acid. The acidity of the urine was determined at least once daily during para-aminobenzoic acid therapy. The amount of sodium bicarbonate was varied as required to keep the urine approximately neutral in reaction. After this plan was adopted, vomiting was encountered very infrequently.

Para-aminobenzoic acid was available in tablets of 0.5 Gm. each and in capsules of 0.3 Gm. each. Neither form was suitable for administration to typhus patients, who could not be persuaded to swallow the large number of tablets or capsules required for each dose; but they took powdered para-aminobenzoic acid readily if it was suspended in water or partially dissolved in a sufficient volume of 5 per cent sodium bicarbonate solution to render the mixture slightly alkaline. The usual amount was 2 Gm. of powdered para-aminobenzoic acid with 25 cc. of sodium bicarbonate solution. After swallowing the mixture, the patient was quickly

TABLE 2.—Comparison of the Clinical Severity of Nine "Untreated" Control Cases and Ten Cases Treated with Para-Aminobenzoic Acid in Group 1

	Number and Percentage of Patients in Each Classification				
	B	C	D	E	F
"Untreated" control cases.....	0	1 (11%)	2 (22%)	1 (11%)	4 (44%)
Cases treated with para-aminobenzoic acid.....	8 (80%)	1 (10%)	1 (10%)	0	0

given water to take away the slightly unpleasant taste of the drug. This method of administration was entirely satisfactory in most instances. Two patients, however, took their initial doses with difficulty, and no further attempt was made to treat them because of their uncooperative attitude. They have not been included in this report.

Method of Determination of Para-Aminobenzoic Acid in the Blood.—The blood levels refer to free para-aminobenzoic acid as determined by Marshall's and Litchfield's procedure for sulfanilamide.¹¹ The standard solution of sulfanilamide was replaced by a standard of para-aminobenzoic acid. For some of the tests a Dubosq colorimeter was used; for the majority, however, a Coleman spectrophotometer was employed.

The Results of Treatment with Para-Aminobenzoic Acid.—In group 1, of the 10 patients who received para-aminobenzoic acid, 8 were classified as B cases, 1 was C and 1 was D. Of the 9 alternate control cases, 1 was C, 3 were D, 1 was E and 4 were F (table 2). The temperature charts of the patients in group 1 are shown in charts 1 and 2. All temperatures were taken rectally, with a single exception, patient 5768, chart 2, the values for the nineteenth day to the twenty-fourth day indicating oral temperatures. The solid line beneath the temperature curve shows the period of administration of para-aminobenzoic acid.

Group 2. The results of this consecutive series are similar to those in group 1. Of 7 cases 3 were B, 3 were C and 1 was D. Temperature curves are shown in chart 3. The temperature curve of a typical untreated case (12412) appears at the top of chart 2 for comparison with the para-aminobenzoic acid cases.

The 17 cases in groups 1 and 2 are contrasted with the 44 "untreated" cases in table 3, which shows the incidence of clinical severity in the two groups.

Group 3. Two patients in this group were treated for the purpose of extending the experience with para-aminobenzoic acid to patients admitted in the eighth and ninth day of illness. One patient, 6546, was started

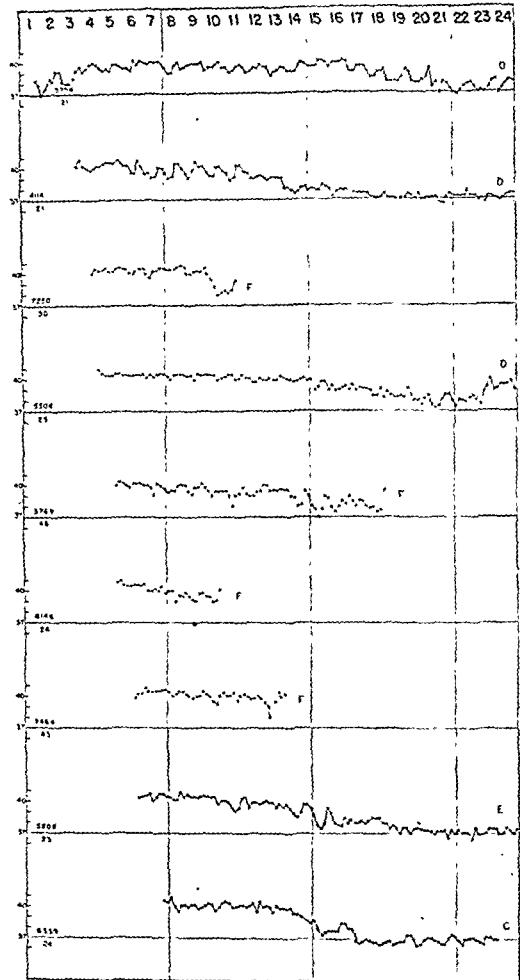


Chart 1.—Group 1 controls. Temperature charts of 9 "untreated" control typhus patients, arranged according to the day of illness at the time of admission to the hospital. The clinical classification of severity appears at the end of the fever curve. Values indicate rectal temperature in degrees centigrade. The numbers across the top of the chart refer to the day of illness. The hospital number and age of the patient appear at the beginning of each temperature curve.

on para-aminobenzoic acid in his ninth day. He became progressively worse and died on the thirteenth day.

Patient 7,100, admitted at the end of his eighth day of illness, was severely dehydrated. His urine contained many red cells on admission, but these disappeared in the next two days. The clinical course was complicated by a secondary rise in temperature associated with pain in the right flank, which may have been related to previous renal or ureteral disease.

Finally, patient 6,811, a man aged 70, was given para-aminobenzoic acid in the third twenty-four hours of

11. Marshall and Litchfield, quoted from technical manual Methods for Laboratory Technicians, War Department, Oct. 17, 1941, p. 134.

his illness to ascertain whether para-aminobenzoic acid would affect the outcome. The patient died on the eleventh day; aspiration of para-aminobenzoic acid and sodium bicarbonate may have contributed to the death of this patient. His case is discussed later. Temperature curves are shown in chart 4.

The pathology of the 2 fatal cases in this group will be described in a later United States of America Typhus Commission report by Lieut. Comdr. W. B. McAllister Jr. (MC), U.S.N.R.

The experience with para-aminobenzoic acid is summarized in tables 4 and 5, which show the clinical

15080). No rash was seen at any time in 2 of the treated patients whose skins were very dark (5247 and 15000).

It was interesting to note that 2 patients who were treated in the second and third day of illness nevertheless developed a rash which was distinctive of louse borne typhus in every particular except that the lesions were relatively few in number and tended to disappear quickly.

Effect of Para-Aminobenzoic Acid on the White Blood Cells.—One patient, not tabulated in the series, developed a low white blood cell count (2,900) after twenty-four hours of treatment, and para-aminobenzoic acid therapy was discontinued. One other patient, 6540, likewise developed a low white blood cell count (2,950) but in his case the low count did not occur

TABLE 3.—Comparison of the Clinical Severity of Forty-Four "Untreated" Cases and Seventeen Cases Treated with Para-Aminobenzoic Acid in Groups 1 and 2 Combined

	Number and Percentage of Patients in Each Classification				
	B	C	D	E	F
44 "untreated" cases.....	1 (2%)	12 (27%)	18 (41%)	5 (11%)	8 (18%)
17 cases treated with para-aminobenzoic acid.....	11 (65%)	4 (23%)	2 (12%)	0	0

TABLE 4.—Comparison of the Average Duration of Fever * and Clinical Severity of Forty-Four "Untreated" Cases and Seventeen Cases Treated with Para-Aminobenzoic Acid (Groups 1 and 2)

Classification of Severity	Average Duration of Fever, Days		
	Forty-Four "Untreated" Cases	Seventeen Cases Treated with Para-Aminobenzoic Acid	
		Primary Continuous Febrile Period Only	Primary and Secondary Febrile Periods Combined
B	18	11	11
C	15	11	15.5
D	19.5	10.5	14.5
E	23.5	..	..
F	(13)	..	..
Average for all cases except F	18.5	11	12.5

* A rectal temperature above 37.5 C. (99.5 F.) is considered as evidence of fever.

until he had been afebrile for two days. Para-aminobenzoic acid had been discontinued twenty-four hours before the low value was obtained. The count fell further to 1,850 and rose thereafter to 3,500 at the time of discharge. The return of the white blood cell count toward normal values was slow in both patients, but neither one showed any other evidence of untoward drug reaction, and both had a mild, uncomplicated course. The differential count did not reveal any significant alteration in the relative percentages of polymorphonuclear leukocytes and lymphocytes. In the other para-aminobenzoic acid cases a tendency for the white blood cell count to drop to values between 5,000 and 3,500 was observed.

Effect of Para-Aminobenzoic Acid on Red Blood Cells and Hemoglobin.—No changes in red cell count or hemoglobin estimation were encountered in the para-aminobenzoic acid cases that were not consistent with typhus.

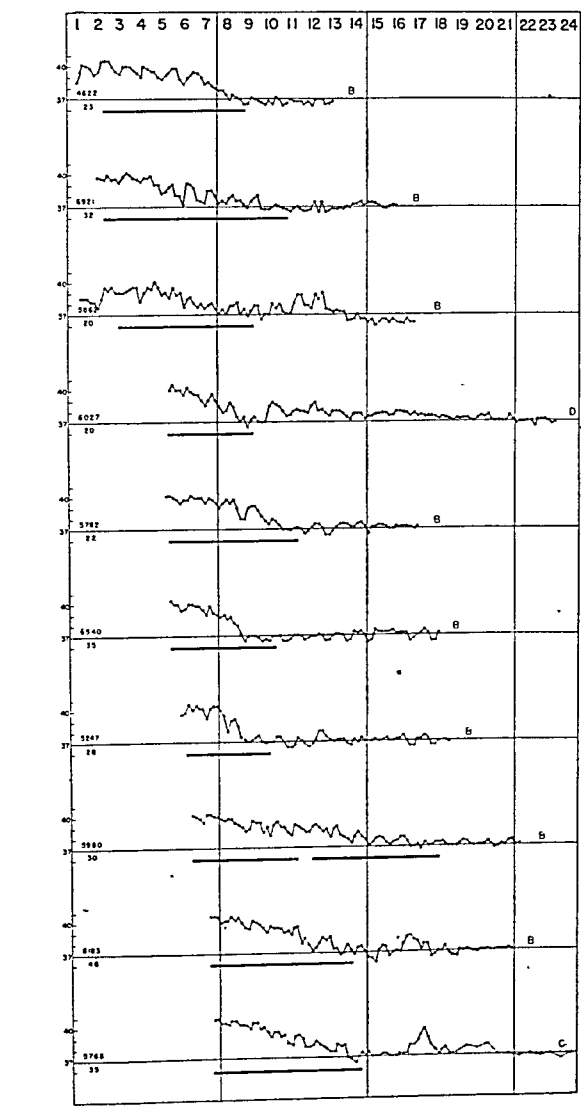


Chart 2.—Group 1 para-aminobenzoic acid cases. Temperature charts of 10 typhus patients who received para-aminobenzoic acid, arranged according to day of illness at the time para-aminobenzoic acid was started. The period of administration of para-aminobenzoic acid is indicated by the heavy line beneath the temperature curve. The clinical classification of severity appears at the end of the fever curve. The numbers across the top of the chart refer to the day of illness. The hospital number and age of the patient appear at the beginning of each temperature curve.

severity, duration of fever, total amount of para-aminobenzoic acid, complications and laboratory data.

Effect of Para-Aminobenzoic Acid on the Rash of Typhus.—Fifteen patients who received para-aminobenzoic acid had a definite rash, which was not as extensive, however, as that seen in the majority of "untreated" patients. The rash was considered to be questionable in 3 treated patients (4622, 14868 and

Effect of Para-Aminobenzoic Acid on Kidney Function.—There was no evidence in any of the para-aminobenzoic acid cases that the drug had produced renal complications. Indeed the low incidence of nitrogen retention¹² (12 per cent) in the treated cases (groups 1 and 2) as contrasted to that in the "untreated" cases (44 per cent) suggests that para-aminobenzoic acid may prevent renal damage in typhus. This subject receives further consideration in the comment.

Secondary Rise in Temperature.—In 9 cases, after the temperature had declined either to normal or at least to a point definitely below the expected value for typhus cases, para-aminobenzoic acid was discontinued.

A secondary rise in temperature was then observed, varying from minimal brief elevations above normal to moderately high fever of several days' duration. When this phenomenon was first encountered, several explanations were considered: (a) that it represented a recurrence of typhus; that is to say, a release phenomenon related to the premature withdrawal of the inhibitory effect of para-aminobenzoic acid on the typhus rickettsias; (b) that there might be complicating infections; (c) that the fever was attributable to para-aminobenzoic acid alone. After careful survey of all

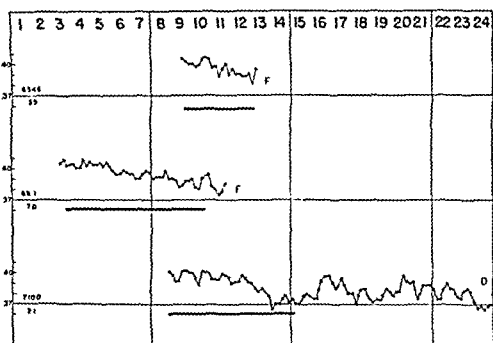


Chart 3.—Group 3 para aminobenzoic acid cases. Temperature charts of 3 typhus patients who received para aminobenzoic acid. Other details are explained in the description of chart 2.

the information available, it seems likely that the secondary rise was a manifestation of typhus, as postulated in *a*. Unfortunately this point was not investigated by inoculation of animals with blood taken during the secondary febrile period. One patient, 5768, had an exacerbation of chronic amebic dysentery, which offers a possible explanation of the secondary fever, although the latter did not closely coincide with the onset of diarrhea.

The high incidence of secondary febrile periods raises the question whether therapy was adequate in amount and duration. The patients who developed the secondary fever might have had such a widespread dissemination of rickettsias that they would have been D, E or F cases if untreated and might have required longer, more intensive treatment with para-aminobenzoic acid for elimination of the secondary rise in temperature.

A striking feature of the secondary febrile period was the paucity of symptoms and signs of typhus of a degree comparable to the height of the temperature. Mild headache and slight anorexia were the only constant complaints.

Importance of Early Treatment.—The best results were obtained when para-aminobenzoic acid was started on the second and third days of illness. Some effect was noted when treatment was begun as late as the seventh day. In this study the only ninth day patient who was treated, 6546, died on the thirteenth day despite large doses of para-aminobenzoic acid. It is clear that a very much more extensive experience with para-aminobenzoic acid would be required to define the limits within which beneficial results might be expected. The importance of early treatment is quite obvious, however.

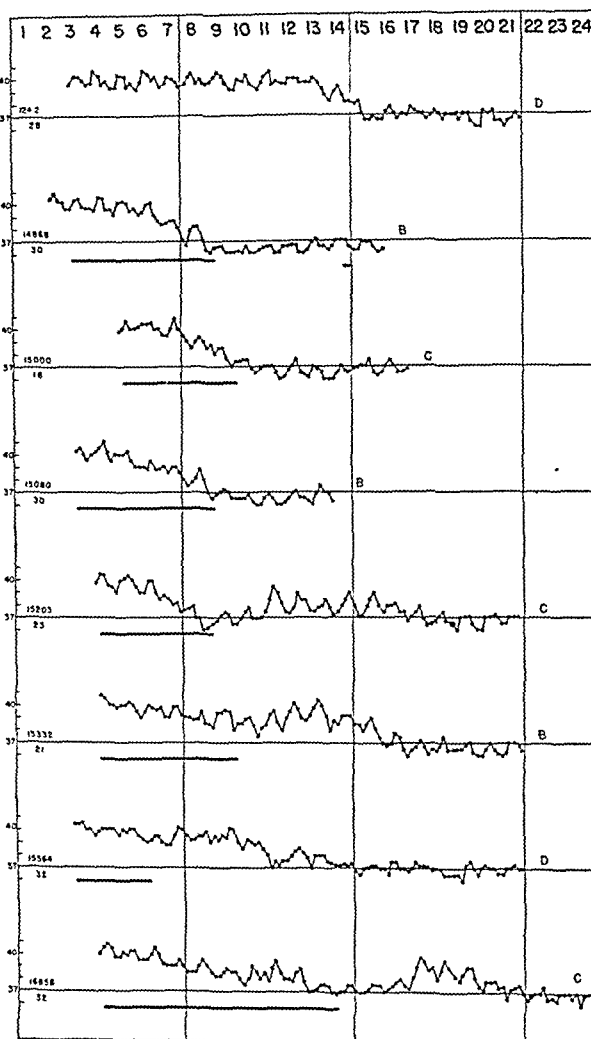


Chart 4.—Group 2 para aminobenzoic acid cases. Temperature charts of 7 cases of typhus treated with para aminobenzoic acid consecutively without alternate control cases. A typical fever chart of an untreated patient, 12412, appears at the top of the chart for comparison with the treated cases. Other details are explained in the description of chart 2.

Influence of Age on Results Obtained with Para-Aminobenzoic Acid.—Only 1 patient was given para-aminobenzoic acid who was outside the 18 to 48 age group. This patient was 70 years old, and treatment was started on the third day of illness. Although he received a large amount of para-aminobenzoic acid, the patient died. His case is discussed later.

Within the 18 to 48 age group, among the cases treated before the end of the seventh day of illness, the increase in age is not associated with increase in severity of illness. In the treated series the average age in the B cases is 29 years, C cases 27 years and

12. Blood nonprotein nitrogen values of 45 mg. per hundred cubic centimeters or higher are interpreted as evidence of nitrogen retention. Among the 44 "untreated" cases, blood nonprotein nitrogen determinations were made in 32 cases. Of these 14, or 44 per cent, were greater than 45 mg. per hundred cubic centimeters at some period in the course of the illness.

D cases 26 years. In the "untreated" series the average age in C and D cases is 25 years, in E cases 26 years and in F cases 33 years. Table 6 shows the relation of average age to clinical severity for both groups.

Contraindications to Para-Aminobenzoic Acid Therapy.—A white blood cell count below 3,000 has been regarded as a definite contraindication to further para-aminobenzoic acid therapy. Since there was a general tendency toward leukopenia, and since 2 patients had counts below 3,000, it is important to obtain daily white blood cell counts during the administration of para-aminobenzoic acid.

In the presence of severe dehydration and oliguria the usual plan of treatment (initial dose of 4 to 8 Gm.

In 3 instances very high concentrations of para-aminobenzoic acid in the blood were encountered. The maximum value in the series was 49 mg. per hundred cubic centimeters. One patient became very drowsy and disoriented when his blood level was approximately 40 mg. per hundred cubic centimeters. Another patient became delirious when his blood level was 35 mg. per hundred cubic centimeters. Although these findings could be ascribed solely to typhus, nevertheless they were regarded as toxic manifestations of para-aminobenzoic acid because they promptly disappeared when the blood level fell to a low value.

If a patient is too weak or stuporous to swallow properly, the administration of para-aminobenzoic acid

TABLE 5.—Summary of the Data from Twenty Cases Treated with Para-Aminobenzoic Acid¹

Case No.	Age, Years	Body Weight, Lbs.	Duration of Illness When Treatment Began, Days	Duration of Treatment, Days	Total Amount of Para-Amino-benzoic Acid Given, Gm.	Duration of Con- tinuous Fever, Days	Duration of Sec- ondary Fever, Days	Lowest W. B. C., per Cu. Mm.	Maxi- mum N.P.N. ³ Mg. %	Maximum Titer ²			Complications	Sever- ity
										Weil- Felix	Complement Fixation			
											Epidemic	Murine		
4622	23	135	2	6½	168	8	0	7,300	30	640	1024*	16	None	B
6921	32	119	2	8½	182	9	0	5,850	31	640	512	Neg.	None	B
3562	20	152	3	6	154	12	0	4,000	24	1,280	128	..	None	B
14865	50	102	3	6	79	8	0	3,800	35	5,120	24	..	None	B
15564	32	123	3	3	62	13	0	4,700	63	640	1024*	256	Nitrogen retention; ⁴ ophthalmitis	D
15080	30	103	3	5½	92	8	0	4,550	..	640	....	..	None	B
15352	21	102	4	6	81	16	0	3,600	39	5,120*	1024	16	Otitis media; dental abscess	B
15303	23	114	4	4½	87	8	8	6,250	..	640	1024*	Neg.	None	C
16358	32	135	4	9½	216	15	6	3,300	36	2,560	1024*	Neg.	None	C
15000	18	100	5	4½	70	9	0	6,050	40	10,240	24	..	None	C
6027	20	123	5	4	94	8	8	5,630	29	5,120*	1024*	Neg.	Branchopneumonia; ⁴ transient heart failure; ⁴ para- amino- benzoic acid intoxication	D
5782	22	125	5	6	146	10	0	5,650	32	5,120*	1024*	Neg.	None	B
6540	35	128	5	5	115	8	0	3,850	32	3,120	1024*	8	None	B
5247	28	125	6	1	100	9	1	5,100	43	2,560	1024*	256	None	B
5980	30	117	6	11	195	16	0	4,200	31	5,120*	1024*	Neg.	? Para-aminobenzoic acid intoxication	B
6183	45	125	7	6½	148	13	2	3,350	39	80	1024*	Neg.	Mild renal insufficiency	B
5763	35	110	7	7	161	13	4	3,450	46	160	1024*	256	Nitrogen retention; ⁴ exacerbation of chronic amebic dysentery	C
6346	35	132	9	3½	71	13	..	4,150	74	5,120*	Neg.	Neg.	Nitrogen retention ⁴	F
6811	70	123	3	7	103	11	..	4,500	67	Neg.	128*	Neg.	Nitrogen retention; ⁴ broncho- pneumonia; peripheral vascular failure; acute tracheitis	F
7100	21	91	8	6½	104	23	0	5,500	45	5,120*	1024*	Neg.	Nitrogen retention; ⁴ ? chronic renal or ureteral disease	D

1. Groups 1 and 2 are arranged together according to the day of disease when treatment was started. Group 3 cases appear separately at the end of the table.

2. The serologic results indicate the maximum titers obtained from a series of serum samples taken at frequent intervals throughout the period of hospitalization. However, a complete series was not available for test in cases 14868, 15000, 15089, 15303 and 15352; it is probable that somewhat higher titers would have been obtained if more samples had been tested in these cases.

3. When high blood levels of para-aminobenzoic acid were encountered, the total nonprotein value has been corrected for the nonprotein nitrogen contributed by the presence of para-aminobenzoic acid.

4. Blood nonprotein nitrogen values of 45 mg. per hundred cubic centimeters or higher are interpreted as evidence of nitrogen retention in this report.

* This symbol indicates that the end point was not reached, the value being the highest dilution tested.

of para-aminobenzoic acid followed by 2 Gm. every two hours) is likely to produce excessively high blood levels. Until the output of urine has been brought at

TABLE 6.—Comparison of the Average Age and Clinical Severity of Forty-Four "Untreated" Cases and Seventeen Cases Treated with Para-Aminobenzoic Acid (Groups 1 and 2)

Classification of Severity	Average Age	
	44 "Untreated" Cases	17 Cases Treated with Para-Aminobenzoic Acid
B.....	18	29
C.....	25	27
D.....	24	26
E.....	26	..
F.....	33	..

least to 1,500 cc. in twenty-four hours, the schedule of dosage should be modified according to the values obtained by frequent determinations of the blood level.

by mouth should not be attempted, since there is the possible danger of severe tracheitis from aspiration of the drug. One patient, 6811, aged 70, became so prostrated that he was unable to swallow rapidly. As a consequence of overzealous nursing he probably aspirated a fairly large amount of para-aminobenzoic acid and sodium bicarbonate. Oral therapy was discontinued as soon as this was discovered and penicillin was administered, but the patient died twenty-four hours later. At autopsy there was a minimal amount of pneumonitis; the principal finding was intense tracheitis and bronchitis, which was attributed largely to the aspiration of para-aminobenzoic acid and sodium bicarbonate. Although a stomach tube was not employed for the administration of para-aminobenzoic acid in the cases in this series, it is possible that the severe tracheitis of patient 6811 might have been avoided if a tube had been passed when difficulty in swallowing first developed.

Early in the experience with para-aminobenzoic acid it was considered that the presence or the development of a bacterial infection might constitute a contraindication to para-aminobenzoic acid therapy. For example, treatment with para-aminobenzoic acid was terminated in patient 15564 when he developed suppurative ophthalmia as a complication of late stage trachoma. It is not possible, however, to conclude that bacterial infections actually constitute a contraindication to para-aminobenzoic acid on the basis of the experience gained from the observation of the 20 cases in this study. At the present time the view is held that para-aminobenzoic acid probably should be continued in cases of typhus despite the occurrence of secondary bacterial infections.

The Use of Penicillin for the Treatment of Typhus Complicated by Bacterial Infections.—If organisms susceptible to the action of penicillin are encountered in secondary bacterial infections which may complicate typhus, the use of penicillin to supplement but not to replace para-aminobenzoic acid therapy is recommended rather than sulfonamide drugs for several reasons: (a) Sulfonamide drugs in experimental typhus seem to have a deleterious effect;² (b) para-aminobenzoic acid inhibits the action of sulfonamide drugs on bacteria in vitro, a fact which prompts the prediction that sulfonamide drugs would be ineffective against secondary bacterial infections when administered in the presence of a high blood concentration of para-aminobenzoic acid; (c) penicillin has been found to exert a beneficial effect in experimental typhus by Pinkerton and his co-workers, both in mice and in the infected yolk sacs of developing chick embryos.¹³ Clinical trial of penicillin primarily for the treatment of louse borne typhus in the Commission ward has been attempted in 4 cases. It is not possible to decide on the basis of such a limited experience whether penicillin, given early and in large amounts, does or does not affect the course of typhus itself. Nevertheless, by reducing or eliminating bacterial infections penicillin may offer considerable help to a seriously ill patient who would not otherwise survive the extra burden of a bacterial infection superimposed on that of typhus.

Optimum Dosage of Para-Aminobenzoic Acid.—At this time it is not possible to draw any conclusions as to the optimum dosage of para-aminobenzoic acid. It can be stated on the basis of this study that the patients who received the arbitrarily chosen dosage had relatively mild typhus. Whether the amount of para-aminobenzoic acid was excessive or minimal is not known.

COMMENT

The experience through two seasons in Egypt has clearly shown the very low incidence of mild cases of typhus in the "untreated" Egyptian patients in the 18 to 48 age group who were admitted to the Fever Hospital. Only 1 such case was encountered among 44 "untreated" patients in the Commission ward, whereas fatal cases were 18 per cent of the total. By contrast, it was very striking to find 11 mild or B cases in the same group when para-aminobenzoic acid was given before the end of the seventh day of illness among 17

patients, none of whom died. At the time the patients in group 1 were being studied, the mortality from typhus among the unvaccinated male patients aged 18 to 48 inclusive in the general wards of the Fever Hospital was 30. per cent. Furthermore, there were four deaths among 9 "untreated" cases of group 1 in the Commission ward. There can be no question that the typhus which prevailed during the period covered by this study was very severe. The high incidence of mild cases in the treated groups was therefore all the more impressive.

The length of time between the onset of illness and discharge from the hospital provides another demonstration of the difference in severity of illness between "untreated" cases and para-aminobenzoic acid cases (groups 1 and 2). For the "untreated" group the average was thirty-two days, for the para-aminobenzoic acid cases only twenty-one days. The figures do not include fatal cases.

Close daily observation of the patients convinced us, more than scrutiny of fever curves or tabulations of frequency of complications, that para-aminobenzoic acid lessened the severity of typhus. The treated patients developed few of the troublesome complications which make typhus cases so difficult for the nursing staff. The low incidence of prostration, stupor, coma, fall in blood pressure, urinary retention, oliguria, nitrogen retention and incontinence of urine and feces, which are so prominent in the untreated cases, was particularly impressive from the clinical point of view.

The drug appears to be quite safe for human administration. High blood levels (up to 49 mg. per hundred cubic centimeters) were accompanied by minimal constitutional effects. No detectable impairment of kidney function attributable to para-aminobenzoic acid was encountered in any of the cases. That typhus frequently produced severe impairment of renal function was a characteristic observation in the experience of the Commission ward. Therefore, any agent which might augment the tendency of typhus to produce oliguria and nitrogen retention is to be regarded with great suspicion. The absence of any undesirable effect of para-aminobenzoic acid on kidney function in this series is a very reassuring finding.

We wish to emphasize our conviction that a careful daily record of the fluid intake and urinary output is necessary in the care of the typhus patient. In our experience nitrogen retention, with or without oliguria, is the most serious development which may occur in typhus from the prognostic point of view. Without exception the fatal cases of typhus in which the blood chemistry was studied by the Commission, whether in the Commission ward or in the general wards of the Fever Hospital, showed a pronounced elevation of non-protein nitrogen. Forty-four per cent of the "untreated" cases in the Commission study, despite the vigorous administration of fluids (4 to 5 liters daily), exhibited some elevation of nonprotein nitrogen in the blood. Daily examination of the urine, continuous observation of the fluid intake, the output and specific gravity of the urine, as well as determinations of the blood non-protein nitrogen, plasma proteins, hematocrit and urea clearance, aid in the evaluation of renal insufficiency in typhus. This subject will be treated in greater detail in a later report of the United States of America Typhus Commission.

13. Greiff, D., and Pinkerton, H.: Inhibition of Growth of Typhus Rickettsiae in the Yolk Sac by Penicillin, *Proc. Soc. Exper. Biol. & Med.* 53: 116-119, 1944. Moragues, V., Pinkerton, H., and Greiff, D. Therapeutic Effectiveness of Penicillin in Experimental Murine Typhus Infection in *Alba Mice*, *J. Exper. Med.* 70: 431-437, 1944.

Speculations on the Mode of Action of Para-Aminobenzoic Acid.—The rickettsias of typhus are known to multiply inside the endothelial cells of small blood vessels. It is in these cells that they have been demonstrated in tissues from human autopsies.¹⁴ Multiplication of rickettsias outside living cells has not been proved. In one experiment the direct exposure of rickettsias to a concentration of 50 mg. of para-aminobenzoic acid per hundred cubic centimeters for one hour at 38 C. (100.4 F.) had no effect on their virulence for animals.¹⁵ This suggests that para-aminobenzoic acid does not act directly on rickettsias. The clinical data are consistent with this observation. The treated cases did not show a rapid improvement following the administration of para-aminobenzoic acid. The usual finding was that the progress of the disease was arrested and that the patients did not become appreciably sicker than they were at the time treatment was instituted. In the course of four to six days the temperature fell and considerable improvement in condition was apparent, as though the natural defenses of the body had finally disposed of the rickettsias. The hypothesis which best fits this sequence of events is that para-aminobenzoic acid inhibits the multiplication of rickettsias inside the cells, thereby permitting the immunity mechanisms of the body to dispose of them, whereupon the vascular lesions begin to heal. If para-aminobenzoic acid is withdrawn before the immunity mechanisms have finally disposed of the rickettsias, these latent, previously inhibited organisms may then resume their growth and cause an increase in size of the lesions or even the formation of new lesions. The secondary febrile periods which occurred in half the para-aminobenzoic acid treated cases may be explained on the basis of this hypothesis. The usual finding, that the rash of treated cases was less extensive, likewise supports the "inhibition hypothesis." However, it should be noted that in 2 cases a definite rash appeared despite the fact that para-aminobenzoic acid was given very early in the course of the disease. This is regarded as evidence that para-aminobenzoic acid did not completely inhibit the progression of lesions which had already been established.

Para-aminobenzoic acid plays a most important role in the metabolism of many micro-organisms which ordinarily multiply outside the cells of the body. The inhibitory effect of para-aminobenzoic acid on the growth of rickettsias, which are obligate intracellular organisms, opens a wide field for speculation on the metabolism not only of rickettsias but of other intracellular micro-organisms as well. Perhaps para-aminobenzoic acid alters an intracellular enzyme system in such a way as to render the cytoplasm unsuitable for multiplication, possibly by blocking the formation of an essential metabolite which rickettsias are unable to synthesize for themselves.

It is also possible that the action of para-aminobenzoic acid is related to the mechanisms by which rickettsial toxic substances are combated. In this regard it may be pointed out that the patients who received para-aminobenzoic acid did not have the usual degree of prostration and "toxicity" which are part of the picture of typhus. Moreover, such a hypothesis may offer an explanation of the very low incidence, in the treated

cases, of impairment of renal function, the importance of which is stressed elsewhere in this communication. For the purpose of our speculations we may postulate a hypothetical effect of rickettsial toxic substances on the kidney, resulting in impairment of renal function. If para-aminobenzoic acid plays a role in the detoxification mechanisms, this may explain the low incidence of *nitrogen retention* in the treated cases as contrasted to the high incidence in the "untreated" cases. However, there are other obvious considerations which are probably important in the development of the renal insufficiency in typhus; for example actual lesions in the kidney, severe hypotension and dehydration.

The material which is available for analysis does not permit the selection of a single hypothesis to explain our observations on the effect of para-aminobenzoic acid in typhus. Obviously a great deal of work is indicated on the problem of the mode of action of para-aminobenzoic acid.

The results of this study provide other subjects for speculation. Can compounds closely related to para-aminobenzoic acid be found which are even more effective? What is the scope of usefulness of para-aminobenzoic acid therapy in the face of an outbreak of typhus? What is the optimum dosage and plan of administration? What untoward reactions and complications may be expected? Will the course of other rickettsial diseases of man be favorably affected by para-aminobenzoic acid or closely related substances?

SUMMARY AND CONCLUSIONS

Twenty cases of louse borne typhus have been treated with para-aminobenzoic acid. Their clinical course has been compared with that of 44 "untreated" cases. The data from this study show that:

1. Large amounts of para-aminobenzoic acid were administered with ease to patients suffering from typhus.
2. There were no unfavorable effects when para-aminobenzoic acid was properly administered with the exception of a tendency to develop a low white blood cell count.
3. When treatment was started in the first week of illness, the clinical course of the patients who received para-aminobenzoic acid was much less severe than that of the "untreated" patients. The average duration of fever was considerably shorter in the treated group.

It is concluded that large doses of para-aminobenzoic acid exert a definite beneficial effect on the course of louse borne typhus if treatment is started in the first week of illness.

Cosmic Doctrine of Aristotle.—The cosmic doctrine of Aristotle holds that the world is a living being having a soul. Since everything created is for some particular purpose, the body of man is evolved as the habitat of the soul. Matter is composed of five elements, earth, air, water, fire and ether. Every element must be looked on as living, since it is pervaded by the soul of the universe; there is an unbroken chain from the simple elements through plant and animal up to man, the different groups merging by insensible shades into one another; plants are inferior to animals inasmuch as they do not possess a single principle of life or soul but many subordinate ones, as is shown by the circumstance that when they are cut to pieces each piece is capable of independent growth or life—Gordon, Benjamin Lee: *The Romance of Medicine*, Philadelphia, F. A. Davis Company, 1944.

14. Wolbach, S. B.; Todd, J. L., and Palfrey, F. W.: *The Etiology and Pathology of Typhus*, Cambridge, Mass., Harvard University Press, 1922.
15. Snyder, J. C.: Unpublished observation.

THE BIOSYNTHESIS OF RIBOFLAVIN
IN MAN

VICTOR A. NAJJAR, M.D.

GEORGE A. JOHNS, M.D.

GEORGE C. MEDAIRDY, M.D.

GERTRUDE FLEISCHMANN, M.D.

AND

L. EMMETT HOLT Jr., M.D.

BALTIMORE

It is clearly established that micro-organisms present in the rumen of ruminant animals will synthesize riboflavin in quantities sufficient to supply the requirements for this factor.¹ Biosynthesis of riboflavin has also been demonstrated in the cecum of the rat,² but in this omnivorous animal the phenomenon is conditioned by the diet, and only under particular conditions is it sufficient to furnish the requirements. Although it seems reasonably clear that riboflavin deficiency does occur in man, it is by no means clear that it always develops whenever the diet is deficient in riboflavin. The possibility that under given dietary conditions the intestinal bacteria of man might synthesize riboflavin, providing protection against deficiency, has never been evaluated. It is our purpose in the present report to describe experiments which demonstrate clearly the biosynthesis of riboflavin in the human intestinal tract—and in considerable quantities.

EXPERIMENTAL

Observations were made on 12 experimental subjects. These individuals were male adolescent youths between 10 and 16 years of age. After a control period on the institutional diet the subjects were placed on an experimental diet consisting of vitamin free casein, crisco, dextrimaltose, a mineral mixture³ and a vitamin mixture⁴ which contained no riboflavin. This diet provided 40 calories per kilogram, distributed approximately as follows: protein 15 per cent, fat 35 per cent and carbohydrate 50 per cent. The food, except for the vitamin mixture, was mixed together and given in equal portions at each meal. The vitamin mixture, given separately, was also supplied in equal quantities at each meal. Each of the food constituents was carefully assayed for riboflavin, but appreciable quantities of this factor were found to be present only in the vitamin free casein, which was found to contain 0.75-1.0 microgram per gram, providing an intake between 70 and 90 micrograms per day in the different subjects. The subjects pursued a sedentary life throughout the experiment. Complete fecal collections were made, which were analyzed for riboflavin in weekly periods. The urinary excretion of riboflavin was followed daily

in the fasting hour specimen,⁵ and complete twenty-four hour excretions were studied periodically. Analyses of riboflavin were made by the fluorometric method of Najjar,⁶ which was modified slightly for the assay of feces.⁷

RESULTS

The subjects remained in excellent health throughout the period of study (three months) with the exception of 1 individual, who developed a Vincent's stomatitis during the second week. This intercurrent infection can hardly be related to the experimental diet, since it cleared without the administration of riboflavin.

The urinary excretion of riboflavin fell during the first two weeks of the study but remained constant

TABLE 1.—Average Excretion of Riboflavin in Feces of Subjects on a Riboflavin Deficient Diet

(Results expressed in micrograms per day based on weekly collection periods)

Con- trol Sub- ject	Period	Week on Riboflavin Deficient Diet									
		Diet Alone					Succinylsulfathiazole Added				
		1	2	3	4	5	6	7	8	9	10
Ca	600		138	620	770	366	450	627	...	1,083	617
Fl	420		189	294	282	278	128	735	...	859	533
Fl	110		460	712	564	320	1,270	975	791	534	801
Hi	272	No	332	642	309	417	282	753	619	497	790
Jo	89	Col-	345	590	600	200	695	967	1,048	711	789
Kl	885	lec-	1,112	470	512	275	555	999	809	825	963
Mi	420	tion	635	302	187	230	906	807	997	619	679
Mo	430	for	...	495	362	475	445	876	672	878	1,033
Mu	207	9 days	...	336	170	84	561	962	833	841	1,023
My	1,400		350	465	605	662	565	920	886	1,050	621
Se	193		322	338	262	140	405	677	565	679	473
W1	126		288	572	475	332	314	687	730	682	725

TABLE 2.—Average Excretion of Riboflavin in Overnight Fasting Hour Specimen of Urine in Subjects on a Riboflavin Deficient Diet

(Results expressed in micrograms per hour)

Subject	Control Period	Week on Riboflavin Deficient Diet									
		Diet Alone					Succinylsulfathiazole Added				
		1	2	3	4	5	6	7	8	9	10
Ca	22	11	10	9	11	14	10	8	6	7	8
Fl	25	7	6	6	8	11	9	8	6	6	6
Fl	27	7	6	6	8	6	8	8	5	5	8
Hi	27	9	9	10	12	11	12	10	5	6	9
Jo	30	11	12	12	10	11	12	10	7	7	11
Kl	39	12	8	10	10	12	14	15	11	9	12
Mi	38	8	12	9	8	9	8	10	6	7	8
Mo	20	16	13	15	12	11	13	12	11	16	10
Mu	35	38	29	24	40	38	32	10	5	5	6
My	24	10	8	9	9	9	10	10	5	5	7
Se	20	8	7	7	6	8	6	10	8	11	8
W1	25	10	7	5	6	7	10	8	6	6	9

thereafter, its level being of the order of magnitude of 6 to 10 micrograms in the fasting hour and 150 and 250 micrograms per day. The excretion of riboflavin in the feces showed no tendency to fall as a result of the riboflavin deficient diet, remaining at levels similar to those observed in the control period (200 to 600 micrograms per day). It was thus apparent that the combined excreta contained five to six times as much

From the Department of Pediatrics, Johns Hopkins University School of Medicine, and the Department of Mental Hygiene, State of Maryland. This study was supported in part by a grant received from Mead Johnson and Company, the ... and the Williams Waterman Fund for the Study of ...

1. Bechdel, ... Dutcher, R. A., and Knutsen, H., *ibid.* 130: 437, 1939. Hunt, C. H., Kick, C. H., Burroughs, E. W., Burke, R. M., Schrik, A. F., and Gerlaugh, P. *J. Nutrition* 21: 85, 1941. Wegner, M. I., Booth, A. N., Elvehjem C. A., and Hart, E. B. *Proc. Soc. Exper. Biol. & Med.* 45: 769, 1940. 2. Guerrant, N. R., and Dutcher, R. A. *J. Biol. Chem.* 98: 225, 1932. *Proc. Soc. Exper. Biol. & Med.* 31: 796, 1934. 3. The Cox Imboden mineral mixture was employed, *Proc. Soc. Exper. Biol. & Med.* 34: 443, 1936. 4. The vitamin mixture, which supplied the following water soluble factors, was divided into three equal doses which yielded the following daily quantities: ascorbic acid 25 mg., nicotinamide 25 mg., calcium pantothenate 1 mg., pyridoxine 1 mg., choline chloride 5 mg., inositol 1 mg., para-aminobenzoic acid 1 mg., and thiamine 1 mg. In addition 5 drops of Mead Johnson cod liver oil concentrate were given daily. The water soluble vitamins were supplied through the courtesy of Merck & Co., Inc.

5. Holt, L. E., Jr., and Najjar, V. A. The Clinical Diagnosis of Deficiencies of Thiamine, Riboflavin and Niacin, *Journal Lancet* 63: 366 (Nov.) 1943.

6. Najjar, V. A. *J. Biol. Chem.* 141: 355, 1941.

7. Fresh stools mixed with glacial acetic acid (10 cc. for each hundred grams) were collected in glass jars. These were protected from light by black paper wrapping and kept in a refrigerator before analysis. Two grams of wet stool was mixed with 20 cc. of fifth molar acetate buffer (pH 4.5) and allowed to stand over a steam bath with frequent stirring for twenty minutes. The resulting mixture was then centrifuged and the sediment extracted with 10 cc. of buffer for ten minutes and likewise centrifuged. The two supernatant fluids were pooled and a 5 cc. aliquot taken for the determination of the riboflavin in the same manner described for urine.

riboflavin as was ingested in the food, a phenomenon which could be explained only by the production of riboflavin by the intestinal bacteria. The remote possibility that the stool riboflavin might represent excretion of body stores rather than intestinal synthesis was excluded by experiments on normal subjects in whom intravenous injections of 5 to 20 mg. caused no increase in fecal riboflavin. The fact that riboflavin could be absorbed from the large intestine was demonstrated by means of enemas containing 20 mg. of riboflavin, which brought about a prompt rise in the excretion of riboflavin in the urine.

Because of our observation that the administration of succinylsulfathiazole would inhibit the bacterial synthesis of thiamine in the human intestinal tract,⁸ the attempt was made to decrease the riboflavin synthesis by the administration of this drug. Succinylsulfathiazole was commenced during the seventh week of the study in doses of 1.5 Gm. every four hours. After the ninth week the dose was increased to 3 Gm. every four hours, which was continued until the termination of the study.

Although the administration of succinylsulfathiazole caused a virtually complete disappearance of thiamine from the stools in the course of a few days, very much to our surprise it produced relatively little effect on the output of riboflavin.⁹ None of the twelve subjects showed a reduced riboflavin output in the stools; in fact the daily excretion was, if anything, somewhat higher after the administration of the drug (table 1). Of the 12 subjects, 9 showed no reduction in the urine output, 2 showed a very temporary reduction and only 1, a subject who had previously been excreting quantities of riboflavin considerably greater than the rest, showed a reduction to levels comparable with the other subjects (table 2).

COMMENT

The great excess of riboflavin in the excreta of our subjects as compared with the intake, the fact that it continued without appreciable decrease for twelve weeks and that the subjects remained in excellent health all this time without any loss of weight, all support the view that under these conditions the intestinal bacteria can synthesize enough of this factor to supply the requirements of the individual for this period of time. Disregarding the quantity utilized or otherwise destroyed in the body, it appears that the riboflavin produced in the body was five or six times the intake and in some instances more than ten times the intake. The fact that succinylsulfathiazole failed to inhibit the synthesis of riboflavin to any significant degree suggests that this factor is produced by organisms which are not susceptible to the drug, although it may also be produced by those which are susceptible. Smears of the feces after the administration of the sulfonamide drug still showed an abundance of bacteria to be present, although detailed bacteriologic studies of the stools were not made.

Further studies are needed to find out whether a minute amount of riboflavin such as was present in our experimental diet is needed for the bacterial synthesis of this factor or whether such synthesis would occur in

any case. The conditions under which biosynthesis of riboflavin occurs in man likewise remain to be defined. We have no reason to doubt that under certain conditions riboflavin deficiency does occur in man, but the observations we have presented certainly cast doubt on the high and the universal requirement for this factor that has hitherto been accepted.

SUMMARY

1. Twelve experimental subjects, placed on an experimental diet of purified vitamin free foods, in which only supplements of pure vitamins were given, subsisted for a period of twelve weeks on a diet containing between 60 and 90 micrograms of riboflavin per day.

2. The excretion of riboflavin in the urine, after a preliminary drop, tended to remain constant at a value roughly twice that of riboflavin intake. The fecal excretion remained unaffected at a level of five to six times the intake, a phenomenon which can be attributed to synthesis of riboflavin by the intestinal bacteria.

3. An attempt to inhibit the biosynthesis of riboflavin by the intestinal bacteria by the administration of succinylsulfathiazole for a period of four weeks met with no success.

4. The conclusion is drawn that riboflavin may not be a dietary essential under all conditions. The conditions in which it may be effectively synthesized in the intestine remain to be defined.

Clinical Notes, Suggestions and New Instruments

FATAL AGRANULOCYTOSIS RESULTING FROM THIOURACIL

JULIUS KAHN, M.D., AND ROBERT P. STOCK, M.D.,
LOS ANGELES

Leukopenia and granulocytopenia have been reported as potential dangers in the use of thiouracil when given to thyrotoxic human beings. Similar observations have been made on adult rats which were fed thiourea.¹ Only 1 of the 72 patients in the group reported by Williams and Clute² developed agranulocytosis following the use of thiouracil, but this was not fatal. Astwood³ also discussed 1 nonfatal case in a man whose toxic diffuse goiter similarly was treated with thiouracil. The following, as far as can be determined, is the first death that can be attributed to thiouracil as an agranulocytogenic agent:

REPORT OF CASE

History.—M. M., a white woman aged 62, entered the Cedars of Lebanon Clinic Hospital on March 3, 1944 because of nausea, vomiting and drowsiness of six hours' duration. She had been known to have diabetes for six years and had been negligent both in taking insulin and in adhering to a prescribed diet. Diffuse goiter of relatively mild toxicity had been present for about ten years. In 1940 a course of therapy with Lugol's solution had resolved the thyrotoxic symptoms almost entirely. On this admission to the hospital the patient was in impending diabetic coma with a blood sugar of 450 mg. per hundred cubic centimeters. Her urine showed a strongly positive reaction to tests for acetone and diacetic acid and a 4 plus qualitative Benedict's reaction. Her blood pressure was 200 mm. of

From the Thyroid Committee of the Cedars of Lebanon Hospital. Dr. Kahn is chief of the medical service and Dr. Stock is resident in internal medicine.

1. Goldsmith, E. D.; Gordon, A. S.; Finkelstein, G., and Chariguer, H. A.: A Suggested Therapy for the Prevention of Granulocytopenia Induced by Thiourea, *J. A. M. A.* **125**:847 (July 22) 1944.
2. Williams, R. H., and Clute, H. M.: Thiouracil in the Treatment of Thyrotoxicosis, *New England J. Med.* **230**:657-667 (June 1) 1944.
3. Astwood, E. B.: Treatment of Hyperthyroidism with Thiouracil and Thiouracil, *J. A. M. A.* **122**:77-81 (May 8) 1943.

8. Najjar, V. A., and Holt, L. E., Jr.: Biosynthesis of Thiamine in Man and Its Implications in Human Nutrition, *J. A. M. A.* **123**:683 (Nov. 13) 1945.

9. The possibility that succinylsulfathiazole may interfere with the determination of riboflavin in the stools was ruled out. The drug is not fluorescent under the same optical conditions. Incubation of sterilized stools with added succinylsulfathiazole for two hours at 37 C. showed no change in the riboflavin content.

mercury systolic and 0 diastolic. The response to therapy directed against acidosis was prompt. However, because of the unstable nature of her diabetes, wholly satisfactory control never was possible. During the next two months the patient had a few insulin reactions of minor degree.

As soon as possible after the diabetic acidosis had been corrected, evaluation of the patient's thyrotoxicosis was undertaken and the patient then was placed under the supervision of the thyroid committee of the hospital. The thyroid gland was diffusely enlarged to a slight degree. Exophthalmos was slight, and a fine tremor of the hands was present. A labile pulse varied between 100 and 120 per minute. The basal metabolic rate on the eleventh hospital day was plus 65 per cent on two determinations. Blood cholesterol was 164 mg. per hundred cubic centimeters. A blood iodine test by the Chaney method was 13 (normal, 5 to 7) micrograms per hundred cubic centimeters of plasma. The body weight at that time was 77 pounds (35 Kg.). Blood studies showed the hemoglobin to be 13.7 Gm. per hundred cubic centimeters with an erythrocyte count of 3,970,000 per cubic millimeter. There were 5,100 leukocytes per cubic millimeter with 66 per cent neutrophils, 3 per cent eosinophils, 27 per cent lymphocytes and 4 per cent monocytes.

During this period the patient was feeling well and was consuming 2,500 calories (carbohydrate 200, protein 110, fat 140) daily. Each morning 26 units of crystalline zinc insulin and 34 units of protamine zinc insulin were administered. Because of the age of the patient and the instability of her diabetes, thiouracil was regarded as a desirable agent for managing her thyrotoxicosis.

Beginning April 18, thiouracil was started with an initial dose of 0.8 Gm. per day (in four divided doses) for two days. Thereafter the amount was decreased to 0.6 Gm. per day (in three divided doses). A complete blood count, determination of the basal metabolic rate, routine urinalysis and recordings of body weight were ordered every five days.

Favorable response to the thiouracil was prompt. The basal metabolic rate had dropped in fourteen days to plus 42 per cent, the patient had gained 4 pounds (1.8 Kg.) and the pulse was 80 per minute. Slight enlargement of the thyroid gland was noticed. The response to thiouracil continued to be favorable, with a gradual rise in body weight and progressive lowering of the basal metabolic rate.

On the forty-fourth day of medication with thiouracil the basal metabolic rate was plus 10 per cent, the weight 90 pounds (41 Kg.) and the pulse stable at 80 per minute. At this time the dosage of thiouracil was reduced to 0.4 Gm. per day.

Seven days later the patient suddenly complained of a "swollen, dry throat," and within twelve hours her temperature rose to 101.4 F. Except for moderate congestion of the pharynx, physical findings were unchanged. Next morning the temperature was 98.0 F. The throat was still reddened, and tender submaxillary nodes were palpable. Within twenty-four hours the temperature rose to 105 F. (rectally). Pronounced congestion and edema of the soft palate was present.

The erythrocyte count at this time was 3,650,000, but the leukocyte count had fallen to 1,100 per cubic millimeter, with 2 per cent neutrophils, 1 per cent eosinophils and 97 per cent lymphocytes. Thiouracil was stopped immediately. A throat culture showed a few colonies of *Streptococcus viridans* and a moderate number of colonies of *Staphylococcus aureus*. A transfusion of 500 cc. of whole blood was given promptly. On the next day the leukocyte count was 300 per cubic millimeter, with 1 per cent neutrophils and 99 per cent lymphocytes. The pharyngeal mucosa became more reddened, and numerous blebs were present. Erythematous macules were seen to be scattered widely over the body. Within the next twenty-four hours 1,500 cc. of whole blood was given by transfusion. Other attempts at combating the agranulocytosis included injections of crude liver extract (15 units twice daily), pentose nucleotide (10 cc. injected intramuscularly every four hours) and oral administration of extract of yellow bone marrow. As an added effort against the rapidly progressive infection, penicillin was

administered intramuscularly in doses of 20,000 units every two hours for four doses and then the same amount every three hours.

During the final two days of life the patient presented a profoundly stuporous picture somewhat similar to that caused by diabetes. The carbon dioxide combining power was 38 volumes per cent, and moderate glycosuria persisted. However, there was no acetoneuria, and the blood sugar varied between 56 and 142 mg. per hundred cubic centimeters.

Despite all therapy the coma persisted, the temperature remained high, the buccal and pharyngeal lesions grew worse, jaundice appeared, and the agranulocytosis persisted. The patient died June 14, five days after the appearance of agranulocytic angina.

A total of 30.8 Gm. of thiouracil had been given over a period of fifty-four days preceding the clinical development of agranulocytosis.

Autopsy.—The autopsy was performed by Dr. Rubin Strauss, pathologist of the Cedars of Lebanon Hospital, ten hours and thirty-five minutes after death. The significant findings were as follows:

There was extensive generalized jaundice, and a number of scattered red areas 2 to 7 mm. in diameter resembling petechiae were seen on the torso and extremities. Microscopically these showed hemorrhage and some bacterial masses but no appreciable leukocytic reaction. The buccal mucosa was covered with sordes. The soft palate and pharynx were hyperemic, moderately edematous and in places covered with sordes. No ulcerations were seen. Microscopically no polymorphonuclears were noted, but there was moderate infiltration by small round cells. The bone marrow of several ribs and bodies of vertebrae was abundant and dark red. Microscopically, the cells of the granulopoietic series appeared to be greatly reduced in number.

Except for moderate fibrosis of the mitral leaflets and regional chordae tendineae, the cardiovascular system presented no appreciable abnormality. The lungs were heavier than average chiefly because of congestion and edema. There were scattered areas of hemorrhage but no pneumonia. The spleen was slightly heavier than usual and showed nothing but moderate congestion. Lymph follicles were small but active. The lymph nodes were moderately enlarged but exhibited nothing remarkable microscopically.

There was no evidence of obstruction in the extrinsic bile ducts. The liver was slightly smaller and softer than average; the parenchyma was dark brown and the lobules were indistinct. Microscopically there was considerable distention of the sinusoids; otherwise nothing remarkable was seen. An anatomic basis for the jaundice was not demonstrable. The pancreas was much smaller than average and appeared atrophic both grossly and microscopically. Diffuse fibrosis was readily seen microscopically, as was a striking distortion of the islands of Langerhans. Many of the cells were pyknotic and widely separated. The total number of cells in each islet seemed reduced.

The kidneys were of average size and presented no significant findings grossly or microscopically other than moderate congestion. The adrenal glands showed moderate atrophy of the cortical tissue and pronounced vascular engorgement. The thyroid gland was diffusely hyperplastic, was considerably infiltrated by lymphocytes and contained a few small areas of fibrosis. The pituitary gland and brain presented no abnormality to either gross or microscopic examination.

CONCLUSIONS

Both the clinical diagnoses diabetes mellitus and toxic diffuse goiter are supported by the anatomic alterations. Death in this case doubtless was due to the agranulocytosis with its subsequent agranulocytic angina. The terminal jaundice appears to be explainable only on a basis of toxic hepatosis. It seems quite possible that if polymorphonuclear leukocytes had been available there would have been anatomic evidence of a toxic hepatitis. In view of the ability of thiouracil to produce leukopenia and agranulocytosis, it is assumed that thiouracil was the basis for the agranulocytosis and toxic hepatosis in this case.

The severe diabetes mellitus is believed to have been a contributory factor in the death of this patient.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following article.

HOWARD A. CARTER, *Secretary*.

OCCUPATIONAL THERAPY IN A PRIVATE GENERAL HOSPITAL

JOHN S. COULTER, M.D.

CHICAGO

Occupational therapy is an objective treatment prescribed by a physician to hasten a patient's recovery from disease or injury or to contribute to his adjustment to hospitalization.¹ The activities used as treatment must be sufficiently interesting to the patient to motivate his active participation. The occupational therapist must be trained professionally to carry out the physician's prescription to select and adapt activities which meet the patient's physical and psychologic needs. The occupational therapist should be a graduate of a school approved by the Council on Medical Education and Hospitals and registered by the American Occupational Association.

Occupational therapy is divided roughly into the following groups:

1. *Preventive or Diversional Therapy*.—This type of occupational therapy comprises simple prescribed activities, including recreation, which serves to induce rest, to control general exercise, to prevent neuroses and to sustain morale.

2. *Functional Therapy*.—This type comprises prescribed activities planned to assist in the restoration of articular and muscular function, to improve the general condition, to build physical endurance and to aid in mental rehabilitation and in the treatment of mental disorders. Aitken² has shown the value of functional occupational and physical therapy in the rehabilitation of the industrial casualty.

3. *Prevocational Therapy*.—This type comprises work processes planned and prescribed to prepare a patient for his return to his former employment or for vocational education.

Most large general hospitals maintained by county, state or federal funds have an occupational therapy department. A statement concerning the coordination of the physical and occupational therapy departments by Watkins³ emphasizes that the combined departments should be directed by a physician specializing in physical medicine. The technical personnel in his department consist of a supervisor of physical therapy with six assistants, and a supervisor of occupational therapy assisted by two full time and one half time occupational therapists.

It is believed that every general hospital regardless of size should have an occupational therapy department, because it is as necessary as a physical therapy department and any other therapy. The occupational therapy department should be in the department of physical medicine and under the supervision of a physician specializing in physical medicine. Most private general

hospitals will soon require a department of physical medicine (physical and occupational therapy) in order to carry out the federal-state programs for crippled children, the federal-state programs of physical and vocational rehabilitation and to enable them to care properly for many casualties of civilian industry.

Some insurance companies have begun to establish physical and occupational therapy departments as curative workshops or rehabilitation centers, as units separated entirely from hospitals. The advantage of this plan is that the patient does not feel that he is returning to the hospital for treatment, but the one disadvantage of the plan is that the doctor who originally treated the patient does not see him often. Lieut. Col. Raymond Hussey, M. C., U. S. Army, formerly chairman of the Board of Occupational Diseases, Department of Labor, and chairman of the committee on Workmen's Compensation, Council on Industrial Health of the American Medical Association, states "It is unfortunate, I think, that physical and occupational therapy clinics are organized separately from hospitals, since we all realize that physical and vocational rehabilitation procedures should be given simultaneously with medical and surgical treatment."

Recently an insurance company writing workmen's compensation insurance established a rehabilitation center for cases requiring physical and occupational therapy. The president of the company stated that in some instances of extended convalescence his experience showed that there was a considerable amount of difficulty in the achievement of complete recovery and a working status. In order to determine a solution, the company established the Rehabilitation Center. After a year of operation this insurance company was convinced that efficient physical and occupational therapy, under medical guidance, supplies a satisfactory solution to this problem and that rehabilitation should be instituted as soon after injury as possible. This indicates that rehabilitation should be started in the hospital.

In the last three editions of the Handbook of Physical Therapy some activities of the occupational therapy department at St. Luke's Hospital in Chicago were described. St. Luke's is a general hospital containing 485 beds and supported by private endowments and contributions. In order to illustrate the financial arrangements of an occupational therapy department, St. Luke's Hospital can be cited as an example.

For twenty-five years no charge was made for occupational therapy, because it was classed as a necessary adjunct of hospital service. Two years ago the chief of the medical staff thought that, as occupational therapy was a method of treatment, a charge should be made. These charges are now \$1 per treatment for occupational therapy alone. When occupational therapy is combined with physical therapy, a minimum charge for the first hour or major fraction thereof is 50 cents and each additional hour or major fraction thereof is 25 cents plus the charges for physical therapy treatments. It was as difficult to introduce this added fee for occupational therapy as it would have been to launch a new department. Nevertheless, almost \$900 was received during the first year.

General hospitals should maintain capable occupational therapy departments that can practice preventive or diversional therapy. Without occupational therapy many patients are unable to make the necessary social and institutional adjustments so essential to their recovery. The majority of hospitals provide libraries and radios, and occupational therapy is as important.

1. Manual of Occupational Therapy, Chicago, American Medical Association, 1943.

2. Aitken, A. P.: The Rehabilitation Center, Rhode Island M. J. 26: 286 (Dec.) 1943; Rehabilitation of the Industrial Casualty, Virginia M. Month. 71: 177 (April) 1944.

3. Watkins, A.: Occupational Therapy and Rehabilitation 22: 115 (June) 1943.

The physical therapy and occupational therapy departments at St. Luke's Hospital are under the direction of a physician specializing in physical medicine. In the occupational therapy department are two registered occupational therapists, and usually there is one occupational therapy student who is receiving instruction in the practical phase of this work.

When occupational therapy is being carried out the posture assumed by the patient is most important, whether the patient is in bed or sitting in a chair. Wherever possible, the occupational therapists should see that the following instructions are observed:

I. Regulate Positions in Bed.—Recumbent Position: This position serves to prevent deformity and to improve general circulation.

A. Flatten the mattress: It is preferable to eliminate the pillow from under the head. A flattened chest and a slowing up of the circulation will result if a pillow is used.

B. Place a small pillow or roll under the knee joint. Subluxation of the knee frequently results if this procedure is neglected.

C. Train the patient to lie with his elbows and wrists extended to prevent flexion deformities. The arthritic patient frequently assumes a position in which he flexes the elbows and wrists and rests them on his chest for comfort and body warmth. The pressure of the arm on the chest retards full inspiration and slows up circulation.

D. Prevent deformity of outward or inward rotation of the hips by propping the legs in a correct position with pillows or sandbags.

E. Maintain a 90 degree angle of the ankles and prevent foot drop by using a heavy box or bricks at the foot of the bed to hold the feet at right angles and prevent pressure of the bedclothes.

F. Arrange the equipment so that the patient lying flat on his back may maintain a good functional position.

II. Sitting Position.

A. If possible use a flat canvas or board back rest. If a pillow is used it should be firm and extend from the hips to the shoulders. The chin should be in, the head back and the chest high. A firm pillow or roll under the head of the tibia to flex the hip and knee will prevent the patient from slipping down in bed and assuming a poor position.

B. The patient who is allowed to sit up for his occupational therapy should be in a good functional position.

III. Position in a Chair.—Whether a wheel chair or a regular chair is employed, it should have a straight back. While the patient is sitting up he should be erect with his chin in and chest high. If a pillow is used it should be placed below the shoulders so that the head is not pushed forward and the chest not flattened. The occupational therapist should see that the patient is seated correctly while at work.¹

MENTAL DISEASES

Although St. Luke's Hospital is a general hospital, it has one floor for mental diseases. Here the occupational therapy department has one room (locked when not in use) devoted to these cases. Occupational therapy treatment is given in accordance with the principles of McGraw and Conrad.⁴

In the handling of neuroses the department utilizes occupational therapy as an aid in overcoming the tendency to avoid responsibility, in increasing the feeling of potency, in directing the desire for approval that is characteristic of the hysterical into more useful channels and in the allaying of the restlessness of anxiety.

If the occupational therapist is tactful, manic patients with agitated depressions may be persuaded to work

quietly and to confess later that they have begun to feel more normal when thus occupied. The warning that cannot be too often stressed is that suicidal attempts come, not at the period of greatest inertia, but just at the time when the patient is starting into or coming out of a depression, so that many patients who are just beginning to take an interest in occupational therapy may also be interested in using dangerous tools with great cunning and consequent menace to themselves. The same caution about tools is necessary when dealing with paranoid patients, but those institutions in which paranoids create a minimum of disturbance and are most contented are the institutions that have promptly provided a suitable occupation for each individual. If furnished with an outlet, the drive of these patients is much less violent; but the physician should be aware of an increase in tension among those who have long been permitted to use dangerous tools.

A helpful concept is to grasp the patient's interest at the emotional age level at which we find him living.

The problem in the acute phase of schizophrenia is not so much that of catching the attention of the patient as in maintaining his interest. We cannot be positive as to whether novelty or old habits should be relied on at this point. One patient with acute schizophrenia will be confused by unaccustomed procedures; another will block when old habits call up old conflicts. Not infrequently a woman having a paranoid precox will want to do carpentry or other work that she considers to be a man's occupation.

Generally a patient's expressed wishes to attempt any specific work is gratifying and well worth trying. Some occupational therapists may permit the patient to work out unconscious conflicts with symbolic objects, similar to the method which child psychologists use when they employ toys. This application is truly an analysis and requires all the safeguards of that technic. Dr. Conrad believes that in other than an exceptional case the major aim should be the progressive return of the individual to satisfaction and self confidence in participation in normal living. It is the responsibility of the physician to see that the procedure is adapted to the patient's individual problem.

A most delicate and often treacherous part of the treatment is in prescribing the work. It is rarely advisable for the physician to do this alone, and there are dangers in leaving it all to the therapist. Experience teaches us that correspondence to and fro is time consuming and frequently unsatisfactory; nevertheless there should be some sort of joint action, and records should be kept.

In group treatment it is inevitable that various persons often compete for the credit of the cure and for the loyalty of the patient. We hear from nurses, from recreational aids and from occupational therapists "If I had more of a chance, I'm sure I could have accomplished so much more." Sometimes this is pure rationalization. Occasionally it is valid and might well be heeded at the risk of upsetting the routine a bit. The danger of presenting projects too simple for the highly intelligent, cultured and gifted patient should be borne in mind. This requires fine discrimination on the part of the technician and also an understanding of the background and personality of the patient. This information should be available in adequate record form for the therapist.

We are living in an age of specialization. Occupational therapy is a specialty and as such must bear the

4. McGraw, R. B., and Conrad A., quoted by Backmeyer, A. C., and Hartman, G.: *The Hospital in Modern Society*, New York, Commonwealth Fund, 1943.

criticism as well as the praise due it. Some say that society, industry and medicine have all been overspecialized, and it is therefore somewhat of a paradox that the cry of "back to the patient" has been raised in the past decade. In opposition to the overspecialization is the precept "Treat the whole patient, not just his disease." Occupational therapy is much involved at this point.

Occupational therapy can help people find a better use of their leisure time. Illness and convalescence, even mental illness, such as neuroses and psychoses, provide a convenient opportunity to introduce this principle. Interest will develop in the creative arts and crafts and in craftsmanship, and perhaps also in cooperation with others.

The "joint action" mentioned in this article is accomplished at St. Luke's Hospital by using requisitions which state diagnosis and occupational therapeutic precautions for each patient. These requisitions are made out and signed by the physician in charge of the case. They are supplemented by frequent visits of the psychiatrist to the occupational therapy department and by notes on the clinical record made by the occupational therapist.

The occupational therapist uses a great deal of recreational therapy through the monthly parties and dances for the patients, through games and through social activities.

Functional occupational therapy is usually given in a workshop, which, in a general hospital, should have large enough floor space to assist in the restoration of articular and muscular function in order to build up physical endurance and to aid in the whole physical and mental rehabilitation of physically handicapped patients. In these cases the coordination of the physical and occupational therapy departments is most important. St. Luke's Hospital is planning to enlarge the floor space of the occupational therapy department.

Rehabilitation is the planned attempt, through the use of all recognized measures under skilled direction, to restore those persons who, because of disabilities, do not assume to the greatest possible extent and at the earliest possible time that place in the productive stream of society of which they are potentially capable.⁵ Rehabilitation of the injured must therefore start at the patient's bedside and must be continued during and after the patient's stay in the hospital.

Rehabilitation of the injured requires the cooperation of many services, such as surgery and psychiatry.

Often patients have a psychologic protracted convalescence, and it is therefore necessary to use psychotherapy. The Physical Medicine Department of St. Luke's Hospital employs Solomon's⁶ method in these cases. It has four major divisions:

1. Psychologic understanding of the patient's character in order to avoid emotional trauma to his personality during all his professional and industrial contacts.

2. Psychiatric evaluation of the patient's emotional problems, both related and collateral to his accident, in order to clarify the dynamic meaning of his attitudes and make him understand his own behavior.

3. Careful supervision of all the psychologic aspects of his return to employment so as to avoid maladjustment and, if possible, improve his previous work adjustment.

4. Institute at the first evidence of psychologic protracted convalescence a recreational and exercise program.

Griffiths⁷ calls attention to several principles which should be observed in giving functional occupation therapy. He writes:

The injured man must be divided into two categories. The cripple must have work to do from the outset so that he shall see that he still retains the ability to work. The recoverable must not have any treatment that remotely resembles his daily work, lest his pain or temporary clumsiness should instill in his mind fear for his ultimate recovery.

Prolonged exercise is often better obtained by exercises designed to interest the patient and to divert his attention from the particular group of muscles which we want to exercise. Griffiths suggests:

A choice of exercise is easily made which will achieve the desired movement in each patient without his being conscious that this exercise is deliberately designed to produce that movement. For example, if a group of patients contain one man in whom it is desired to strengthen the vastus internus muscle of the leg by repeatedly bracing the knee, a second in whom it is desired to hyperextend the spine, a third to flex the hip joint, a fourth to raise the arm at the shoulder, these men may be given the simple exercise of bouncing a rather soft football on the floor of a gymnasium hard enough to reach the ceiling. It will be found that, in spite of themselves, the desired movements will be attained time after time during the short period this exercise may be continued.

Functional occupational therapy in St. Luke's Hospital is used in orthopedic and surgical cases in such conditions as fractures, dislocations, strains, sprains, contractures due to burns, lacerations of tendons and peripheral nerve injuries and chronic arthritis and in other injuries. In these cases the prescribing of occupational therapy is based on the fact that the best type of remedial exercise is that which requires a series of specific voluntary movements which form an integral part of a more complex series of coordinated movements for the purpose of securing the end products and thus furnishes direct incentive for sustained effort.

In cases caused by injury it is believed that the occupational therapist would do well in following Kennedy's⁸ suggestions that active exercise should be prescribed as soon as the fracture has been reduced, when the method of fixation has been decided on and when the fixation has been effected. A fracture patient enters the hospital as a healthy man with a fracture and not as a man physically or mentally sick. The less he is placed in the category with the sick patient, and the more he is treated as one who was well before the accident and who expects to remain well, the shorter will be his convalescence period. Because a leg is injured is no excuse for allowing the muscles of the neck, back and the three other extremities to deteriorate and to prolong greatly the convalescence.

The fracture patient needs work therapy—not a vacation but a hardening process. Ways and means should be devised to keep his mind and body occupied from the very beginning.

Occupational therapy needs to be introduced much more widely in general hospitals because, according to Kennedy, occupational therapy is many times more valuable than the usual types of physical therapy for these patients. As an occupant of a general hospital, the fracture patient is too often conditioned to become

5. Minutes of Conference on Rehabilitation, Council on Rehabilitation, Philip P. Wilson, M.D., chairman, 321 West 42d Street, New York.
6. Solomon, A. P.: Rehabilitation of Patients with Psychologically Protracted Convalescence. *Arch. Phys. Therapy* 24: 270 (May) 1943.

7. Griffiths, H. E.: Rehabilitation After Fractures, in *Restoration and Monierie: After-Care and Rehabilitation*, London, the Practitioner, 1943.
8. Kennedy, R. H.: Active Exercise in Fracture Treatment. *Arch. Phys. Therapy* 22: 720 (Dec.) 1941.

ing an invalid. Frequently he requires prolonged care to recover from his hospitalization rather than from his injury.

A fracture patient should be taught how to use all joints and muscles in the region of immobilization, commencing on the first day. He should be given general exercises immediately in order to preserve his musculature. While he is in bed he should be given a job that will occupy both his body and his mind and make him feel that he is still part of the moving world. As soon as the fracture patient leaves his bed he should be taught by some form of occupational therapy and, if possible, something similar to the type of work he performed before his accident.

In the curative workshop power reduction factors, such as psychologic inhibitions, pain, fear and fatigue, are eliminated as much as possible.

It is believed that the psychologic inhibitions of the workshop require that the environmental conditions there be superior to those of the man's normal environment. If one can surround the patient in the workshop with a feeling of well being beyond that to which he is accustomed, one will have accomplished a great deal. This sense of well being can be accomplished by interior decoration, orderliness and absolute cleanliness. To motivate a convalescent patient to leave the ease and lazy life of his personal environment requires that he make considerable mental effort, and this effort can be stimulated through the patient's desire to be in a workshop.

Pain can be lessened by cooperation between the hospital staff and the physical therapy department. The physical advantages of the curative workshop situated close to the physical therapy department are obvious. By heat, diathermy, whirlpool bath, massage and muscle stimulation, pain is diminished and exercise is facilitated.

The patient's fear should be eliminated by cooperation between the occupational therapist and the patient's employer. The physician in charge of a department of physical medicine and the occupational therapist should not give testimony about the patient's condition for the insurance company or for the employers before a court or a workman's compensation board. If this is done, the news is spread that the occupational therapy department is trying to get the patient back to work, not for his benefit, but for the insurance company. This causes fear in all the patients and a consequent loss of confidence in the workshop.

The patient's fatigue can be guarded against by cautioning him that no form of work or play should be continued for more than a relatively short time. Fatigue can be measured in the arm by a hand grasp strength test and in the leg by a pull test for the quadriceps muscle. Fatigue may be mental as well as physical, and for this reason a curative workshop should have both recreational therapy and exercise classes.

Recreational therapy, through competitive games, can often supply the desired exercises that the patient requires. The devices used may be a checkerboard on the floor or wall, darts, pingpong, horseshoes and pool tables.

Recreation gives mental relaxation after the workshop. Games are played with the technician and are manipulated in such a way that the patient is encouraged to strive against and to excel the technician. During rehabilitation of an injured man, one may spend a long period of time training him vocationally, but if he is

unable to achieve his proper position under social conditions he will never become really rehabilitated. A man must be helped to adjust himself to a group and to be at ease in conversation with his companions so that he can join in the games of the group and become a part of it. Citing one example: A man came to the department with an artificial hand. Although we were successful in encouraging him to use both his hand and his arm to saw wood, to hammer nails and to do a pretty good job in the wood working shop, he did not feel at ease socially and kept his artificial hand in his pocket when not in actual use. It was not until he found he excelled at the pool table that he realized that although he had an artificial hand he was on a par with others. Thus, social accomplishment played an important role in his future life.

Classes in remedial exercises not only give therapeutic exercises but may eliminate mental fatigue. Dr. Storms in his Workmen's Compensation Clinic in Toronto, Canada, makes excellent use of these classes. He conducts classes for leg exercises from 9 to 9:30 a. m. and 1:30 to 2 p. m., foot classes from 9:30 to 10 a. m. and 2 to 2:30 p. m., hand classes from 10:45 to 11 a. m. and 3 to 3:15 p. m., and arm exercise classes from 11:30 to 12 m. and 4 to 4:30 p. m. In the leg classes the patients (1) walk over a floorlike apparatus built to simulate uneven ground, (2) walk over a MacKenzie inversion tread, (3) walk over steps of various heights, (4) along a bench 18 inches high and 10 feet long to preserve balance and induce good posture, (5) climb up and down a platform with ladders on both sides 5 feet high, five ladder rungs to climb to the top where there is a platform 3 feet long protected on the sides by 30 inch high hand rails, with another ladder on the end, so that it necessitates climbing up five rungs and down five rungs (fig. 1), and (6) work on a treadmill with hand rails. These classes are organized into groups, and every man with a leg disability attends the leg exercise classes as soon as he is able to do so. The hand and arm groups complete hand and arm exercises with the patients sitting in chairs.

In the treatment of the injured workman, Griffiths' observations on the conditioned reflex of industry should always be observed. He says in part:

The conditioned reflex adds the power producing factor of repetition, and this in the deliberately acquired reflex was originally the result of conscious effort. Impulsive action, although not a truly acquired conditioned reflex, is produced by the cortical memory of deliberate action freed by practice from psychological inhibitions associated with conscious deliberation. Deliberate action becomes an effort of will power or thought; but for deliberate muscle action to be developed into a state of skilled muscle action a period of training is necessary, requiring concentrated mental effort and practice, and this can only lead to the desired skilled action as experience is obtained. Finally, something more is needed before the skill becomes expert. This extra something is not only experience but represents a definite advance in pure psychical effort.

The inhibition of the conditioned reflex may be either external or internal. The external inhibition is produced by some excitatory processes other than the conditioned stimuli in the central nervous system, and of these pain, the anticipation of pain or other fear are of greatest importance.

The conditioned reflex of industry is a very complex affair. Take, for example, the skilled carpenter using a saw. The action is one of pushing and pulling the saw, but long practice has produced a conditioned reflex in which each stroke of the saw corresponds almost exactly with the previous or succeeding strokes. The reflex developed is a nice example of negative

successive induction, but it is not the simple affair of alternate contraction and relaxation of the biceps and triceps or of the serratus magnus and latissimus dorsi muscles. The beautifully balanced muscle action involved depends on many different conditioned stimuli.

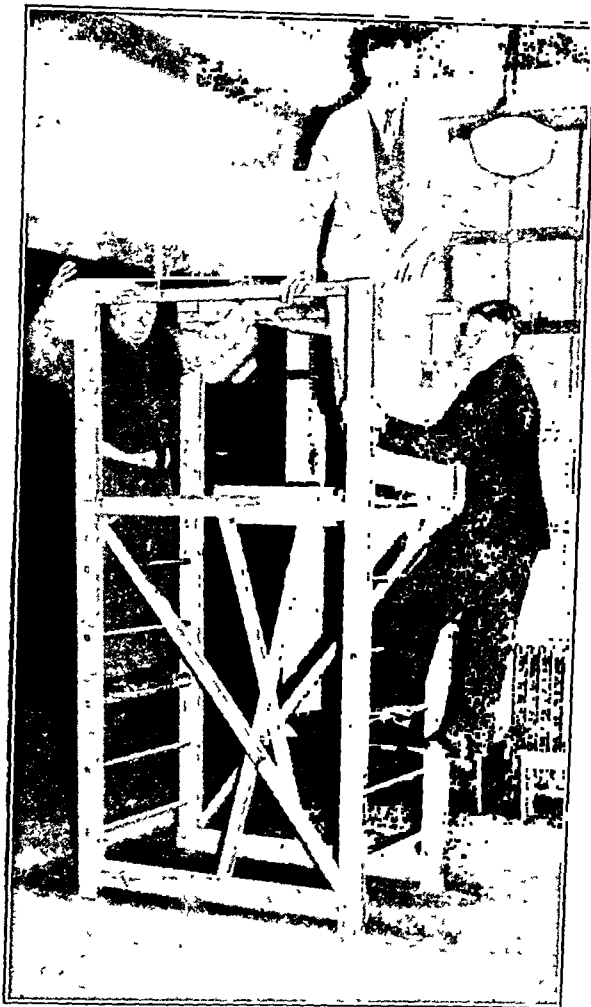


Fig. 1.—Apparatus for leg exercises at Workmen's Compensation Clinic, Toronto.

To mention only a few of these: There are the touch stimuli from both hands. In the saw hand a definite tactile discrimination is associated with the man's own saw (as every tradesman uses his own tools). Thus the same part of the skin of his hand is stimulated every time he grips this particular saw. There is the stimulus of bone vibration set up by the wavelength of the saw being used, so that the farther the saw is thrust the shorter the vibration wave, ultimately suggesting the point at which the reflex action of the thrust shall be reversed. There is in addition the sound reflex, the rasp of the saw, and here again the note alters with the progress of the saw through the wood. When the conditioned reflex is first established a knot in the wood will cause a temporary interruption in the reflex path and tend to throw the muscles out of proper coordination so that there must be a period of conscious action before reflex action is reestablished. But as time goes on the extra resistance of a knot in the wood itself produces a superimposed conditioning stimulus and sets forth a bigger muscular effort without interfering with coordination.

In considering all these industrial conditioned reflexes the law of summation of conditioned reflexes must be borne in mind. This states that when different conditioned stimuli will each call forth a similar reflex, the stimuli acting together will produce a greater effect than they do when acting alone. A conditioned reflex may be reduced but not lost by interference

with one of the conditioned stimuli, provided the other conditioned stimuli are sufficiently strong to overcome the inhibiting effect of the lost stimuli.

With the injured workman, bed treatment is only a minor problem. Over 99 per cent of the injured can and should receive ambulatory treatment, and this must be designed to ensure that they use their conditioned reflexes and so secure the maximum amount of exercise with the minimum amount of fatigue. Man's ordinary walking gait is a combination of postural reflexes with the stepping reflex and various conditioned reflexes, not the least of which is produced by the sensation of the impact of the ground transmitted through the sole of a shoe or boot. Treatment therefore must be aimed at restoring normal walking conditions at the earliest possible moment.

Finally we come to the question of vocational exercise associated with the patient's work. This aspect of treatment must be attempted only when its practice will not produce any of those factors which inhibit the conditioned reflexes which are the foundation of his skill.

As an example take the carpenter who has an injured wrist and is asked to use a screwdriver. The normal action of driving a screw is for him a conditioned reflex, but pain inhibits this reflex action and it does so in this way: In the first turn made, perhaps the normal conditioned reflex was obtained, but with it pain; the movement now becomes conscious movement and the anticipation of the pain produces a static



Fig. 2.—Apparatus for arm and shoulder muscles. A man laborer exercising his grip and shoulder muscles at Rehabilitation Center, B. C.

contraction of muscle to resist the anticipated movement. This inhibits the conditioned reflex with resultant incoordination of muscle action and loss of power. But the effect does not end there. With pain and work linked in the man's mind, fear is born—the fear of incapacity for work—and this fear further inhibits the conditioned reflex. It has been a mistake, therefore, to attempt to restore the conditioned reflex of the

man until the arm has become relatively free from those factors of pain and stiffness which would inevitably inhibit the desired action.

What has been said of vocational therapy applies equally to so-called "light work." The man has been given work of a



Fig. 3—Gravel box and adjustable fence apparatus for reconditioning an industrial conditioned reflex at Rehabilitation Clinic, Boston.

lighter character in his own trade before he is sufficiently free from pain and while still liable to early fatigue. As a result, he develops inhibition of his previously work-conditioned reflexes, leading to increased clumsiness and to despondency. If he has not been employed at the lighter forms of his old job, all too often he has been given work which involves industrial degrading—a bricklayer becomes a tea-boy—and one of his worst fears is realized. His mind now becomes so concentrated on the injured part that subconscious movement becomes almost impossible and the most rapid road to recovery—restoration through exercise—is barred to him.

We are enlarging the floor space of St. Luke's Hospital Curative Workshop to give our patients the necessary work to take advantage of the industrial conditioned reflexes. Dr. Storms in the Workmen's Compensation Clinic at Toronto, Canada, gives his patients occupational therapy that eventually works into industrial conditioned reflexes.

Following are some examples of Dr. Storms's occupational therapy workshop: A bricklayer with a disabled hand was given a thousand bricks and told to arrange a part of them in a design on the floor first. Later the bricklayer was handling all the bricks without mortar, to build walls. He knew how many bricks he needed to handle at his job each day, and from the number he was able to handle each succeeding day in the workshop he saw how he was improving and how close was the time of his return to work. A sign painter was ready for work, except that his grip and shoulder muscle were not strong enough for him to pull on the ropes that raised and lowered his swinging

scaffold; Dr. Storms rigged overhead a compound pulley and had the patient pull on a rope and lift weighted bags of sand attached to the other end of the rope, just as was done at his occupation. When he was able to lift a certain weight, the painter was confident that he was ready to return to work.

A brake is also arranged for switchmen in this workshop, and there is a platform built waist high for freight workers. Ordinarily boxes are filled with weighted loads. The disabled patient loads the boxes onto a wheelbarrow and wheels them to another place, where he then unloads. A large tree trunk to saw with cross cut saws is provided for lumberjacks. Wood is split by blacksmiths or other workmen who employ mallets or hammers. A gravel box is provided with a fence that can be varied in height. Laborers who use shovels at their work can shovel gravel over this fence (fig. 3). Dr. Storms has rigged hand and foot levers which are weight regulated by cans or bags of sand attached to the beams for steam shovel operators (fig. 4). Painters are given work with paints and brushes in this workshop.

This principle of occupational therapy sometimes results in rather humorous situations. A tombstone engraver was injured in the arm. In the workshop he was provided with a cutting stone and other tools of his trade. During the course of his treatment he engraved "In loving memory of" and the names of the physical and occupational therapy technicians on a tombstone.

Occupational therapists are required to visit the industries, railroads or other places where the patients had been employed prior to their admittance to the hospital in order to observe men at work in these industries and therefore to be better equipped to devise occupational therapeutic apparatus and to prescribe methods to fit the disability of the patient with due consideration of his future employment. Therapists should know how hard the men must work in a given trade and what the trade names are for each occupation. If a patient states that he is a "holder-up," the occupational therapist should know that he "holds

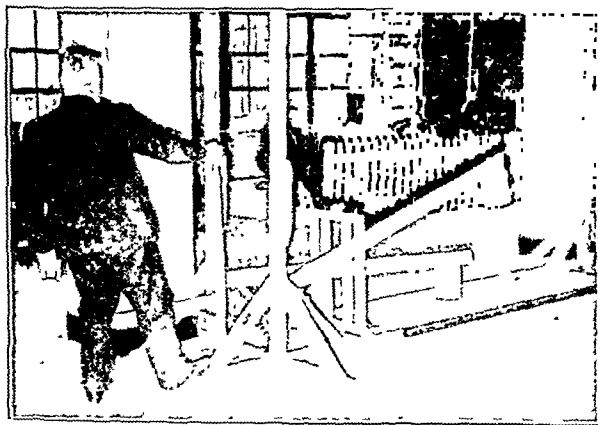


Fig. 4—Apparatus for reconditioning industrial conditioned reflexes at Workmen's Compensation Clinic, Toronto. A steam shovel operator pulling hand lever where resistant force is regulated by positions of weight attached to beam.

a dolly for the rivet" and should also know what a "dolly" is and weighs, what muscles are affected in this operation, what the joint movements are and what the patient requires in the methods of occupational therapy in order to get him back to his work.

Occupational therapy is one of the best forms of treatment for injuries. It diverts the patient's mind from his injury and improves his morale. Mock¹⁰ stated in a previous edition of the Handbook of Physical Therapy:

One of the commonest causes for traumatic neuroses is failure of continuous active treatment until the surgeon is assured that his patient is well on the way to an economic end result; that is, able to carry on once more. The diagnosis of a broken back, a skull fracture or a fractured pelvis often strikes fear and dread into the heart of the patient; yet the treatment of these conditions in a large majority of cases is comparatively simple and the end results are extremely good. Many times treatment consists in simply putting the patient to bed and keeping him as quiet as possible from six weeks to three months or, in some cases, in addition to rest, of traction applied to the lower extremities. The surgeon makes his daily round satisfied with the treatment of the physical condition and the progress being made and never recognizes or even dreams of the fear and anxiety that are gnawing at the patient's mind. When the day comes for the patient to leave his bed and begin to move about, the surgeon is disgusted with the lack of cooperation on the part of the patient, the unwillingness to try to help himself and the absurdity of his complaints.

All such patients, in addition to the actual surgical treatment, need properly directed physical therapy and occupational therapy, which are the logical adjuncts to the usual surgical procedures. . . . Occupational therapy keeps a patient's mind and hands employed for a large part of the day, filling in the gaps between the surgeon's visits and the physical therapy and leaving little time for the fears and germs of traumatic neuroses to develop.

CARDIAC CONDITIONS

One of the big workmen's compensation insurance companies recently stated that the patient with heart disease but with good compensation may do well in special placements which do not require physical effort sufficient to aggravate the crippled part. In the average stable industry there are about 8 per cent of the entire personnel who are cardiac patients. This group of trained artisans need not and should not be discarded. With proper medical supervision, with shifting of placement and general oversight, they can continue in active service for many years without shortening or jeopardizing their lives. This group does not include the many persons who die suddenly of a heart attack and who had previously shown no symptoms referable to the heart. Dr. W. D. Stroud, a member of the Council on Industrial Health of the American Medical Association, published a detailed discussion of this subject.¹¹

FUNCTIONAL CLASSIFICATION OF PATIENTS WITH HEART DISEASE

CLASS I.—Patients with Heart Disease and No Limitation to Physical Activity.—Ordinary physical activity does not cause discomfort. Patients in this class do not have symptoms of cardiac insufficiency, nor do they experience anginal pain.

CLASS II.—Patients with Heart Disease and Slight Limitation to Physical Activity.—Patients in this class are comfortable at rest. If ordinary physical activity is undertaken, discomfort results in the form of undue fatigue, palpitation, dyspnea or anginal pain. Competition in athletics and other strenuous activity, even hurrying, are to be avoided. Activity should be graded according to cardiac tolerance. A vocational plan

should be made according to the permanent mechanical involvement of the heart.

CLASS III.—Patients with Heart Disease and Pronounced Limitation of Physical Activity.—Patients in this class are comfortable at rest. Discomfort in the form of undue fatigue, palpitation, dyspnea or anginal pain is caused by more than ordinary activity. Occupational therapy is first used to induce rest from the cardiovascular standpoint, allowing the circulation to slow down and the reserve power to overcome infections. By this means ultimate damage is minimized. Light activities and a program of graded exercise may later be indicated.

CLASS IV.—Patients with Heart Disease and Inability to Carry on Any Physical Activity Without Discomfort.—Symptoms of cardiac insufficiency or of the anginal syndrome are present in patients in this class, even at rest. If any physical activity is undertaken, discomfort is increased. In this class, as in class III, occupational therapy is used to induce rest as well as to decrease anxiety and fear. The program is limited to mental activity and may prove of distinct value as a palliative measure.¹²

In a large general hospital, such as St. Luke's Hospital, the occupational therapy department is frequently ordered to give preventive or diversional occupational therapy to persons with heart disease. It is believed that these patients should be given functional occupational therapy in the curative workshop to improve their general condition, to aid in their mental rehabilitation and to aid their attending physician to prescribe the amount of exercise that his cardiac patient can take. Too often such a patient is sent home from the hospital with such inadequate instructions concerning exercises as "Do not overdo." Although exercise cannot be definitely prescribed, it should not be left entirely to the discretion of the patient. Mackenzie¹³ maintains that the object of exercises—the strengthening of the heart muscle—is too often forgotten. He states that, by summarily laying down that so many yards should be walked one day and so many another day, the physician shows that he has failed to take into account the peculiar nature of the heart functions. The power of response of the heart to effort varies greatly in the same individual from time to time—one day a patient with an impaired heart can undertake a great deal of effort with comparative comfort, whereas on other days the same amount of effort causes him distress. This is because the heart may be disturbed by a variety of conditions such as gastric or intestinal disturbances, lack of sleep and the state of the weather. The patient's sensations are therefore a valuable guide and may indicate the amount of effort which can be undertaken by him with safety in all circumstances.

Stroud and Comstock¹⁴ state that patients with organic heart disease who are unable to carry on any physical activity need occupational therapy which gives practically absolute rest from a cardiovascular standpoint. Here, remuneration for articles sold, future vocation and so on should be minor considerations. If practical they should certainly be taken into account, but not at the expense of the main object of such therapy; that is, mental and physical rest in order to

10. Mock, H. E. and Abbey, M. L.: Occupational Therapy, in Handbook of Physical Therapy, ed. 3, Chicago, American Medical Association, 1939.

11. Stroud, W. D.: The Rehabilitation and Placement in Industry of Those Handicapped with Cardiovascular Disease, J. A. M. A. 105:1401 (Nov. 2) 1935.

12. Manual of Physical Therapy, War Medicine 2:295 (Mar.) 1942.

13. Mackenzie, M., and Orr, J.: Principles of Diagnosis and Treatment, in Heart Affections, ed. 2, London, H. K. Lewis, 1927.

14. Stroud, W. D., and Comstock, C. R.: Physical Therapy in Cardiovascular Disease, Principles and Practice of Physical Therapy, H. K. Lewis, Md., W. F. Prior Company.

relieve the circulation of much of the load which the heart must carry. It is the relief from this burden which allows the heart muscle, previously unable to carry on its work of keeping up an efficient circulation, to regain much of its reserve, so that if it is not again asked to carry too heavy a load it may do its work efficiently for many years. Proper occupational therapy, by lightening the burden placed on the circulation by mental and physical activity, may, in children with active infections damaging their heart muscle and heart valves, allow circulation to slow down and thus help these children to call on their reserve to overcome the active infection and minimize the ultimate damage to their hearts. These are the two large groups which come under the class of patients with organic heart disease who are unable to carry on any physical activity, those with active infections damaging the heart and those with already damaged hearts which have been required to carry too heavy a circulatory burden through physical and mental effort and whose hearts have temporarily failed. These authors further state that, when such patients progress so that they are able to carry on diminished physical activity or their habitual physical activity, vocational training with the ultimate object of a definite vocation, and finally placement through a bureau for the handicapped, are as important as is the occupational therapy itself.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN E. SMITH, M.D., *Secretary.*

PENICILLIN.—A solid extract of organic nature obtained from certain molds which possesses the property of being able to inhibit the growth of and even occasionally actually destroy certain bacteria. It may be prepared as several salts, including sodium, calcium and ammonium salts.

Actions and Uses.—Penicillin belongs to a class of agents frequently referred to as antibiotics and antimicrobial agents of biologic origin. At present, penicillin is prepared by culture methods and not synthetically. In finished form the powder usually has a brown or yellow appearance and is marketed in air-tight ampuls. The material is unstable in air, hygroscopic and subject to rapid reduction in potency on exposure to heat and acids. Thus the ampuls are stored in the refrigerator and the contents put into solution only as needed. Penicillin is very soluble in water and in saline and dextrose solutions. At present the potency of penicillin preparations is determined by biologic assays, a method which essentially is concerned with the inhibition of the growth of a certain strain of *Staphylococcus aureus* in special medium; this is compared with a standard, and the result is expressed in Oxford units. All specimens also are examined for moisture content, freedom from pyrogens, sterility and toxicity.

Penicillin is indicated in staphylococcal infections with and without bacteremia, clostridial infections, hemolytic and anaerobic streptococcal infections, pneumococcal, gonococcal and meningococcal infections, and the complications caused by such infections. It may prove valuable in syphilis, actinomycosis and bacterial endocarditis, but such use is yet in the experimental stage. Subsequent uses depend on current and forthcoming research.

Dosage.—Penicillin may be administered intravenously, intramuscularly, intracisternally and topically. Subcutaneous injections may be painful. Treatment may consist of repeated intramuscular or constant intravenous injections. The contents

of an ampul, or ampuls, are dissolved in sterile, pyrogen-free distilled water or isotonic solution of sodium chloride. For intravenous injection, concentrations of 1,000 to 5,000 units per cubic centimeter are prepared for direct injection, or 25 to 50 units per cubic centimeter for constant intravenous therapy; for intramuscular injection, 5,000 units per cubic centimeter of isotonic saline solution; for topical application (not the sodium salt in powder form, as it may be irritating when applied locally), 250 units, or more if infection is severe, per cubic centimeter of isotonic saline solution; for subarachnoid space, 10,000 units in isotonic saline solution in a concentration of 1,000 units per cubic centimeter injected once or twice daily; for empyema, 30,000 to 40,000 units injected after the pus has been aspirated. Penicillin solutions should not be used for irrigation.

The dosage of penicillin will vary according to patient and severity of infection, but the objective is to bring the infection under control as quickly as possible. Inadequate dosage may create penicillin resistance in the invading organisms. Penicillin is excreted rapidly, and injections should be repeated every three or four hours unless continuous infusion is employed. In serious infections with or without bacteremia, an initial dose of 15,000 to 20,000 units followed by constant infusion to supply 2,000 to 5,000 units every hour or, in the absence of constant injection, 10,000 to 20,000 units injected intramuscularly every three or four hours, may be employed. After the temperature has returned to normal, the penicillin may be stopped, but the course of the disease must be watched carefully.

In chronically infected injuries, the dosage may be 5,000 to 10,000 units, or more if indicated, every two to four hours with local treatment as indicated. In no instance should proper surgical intervention be omitted. For sulfonamide-resistant gonorrhea, 10,000 units every three hours intramuscularly or intravenously for ten doses may be administered. Treatment depends on findings of culture of exudate.

WINTHROP CHEMICAL CO., INC., NEW YORK

Ampuls Penicillin Sodium: Each ampul contains 100,000 Oxford units.

PERCOMORPH LIVER OIL (See New and Nonofficial Remedies, 1944, p. 636).

The following dosage form has been accepted:

AMERICAN PHARMACEUTICAL CO., INC., NEW YORK

Codanol Brand Percomorph Liver Oil 50% with Vio-sterol: 10 cc. and 50 cc. A source of vitamin A and D in which not less than 50 per cent of the vitamin content is derived from the liver oils of percomorph fishes with viosterol added. Each gram contains not less than 60,000 U. S. P. units of vitamin A and 8,500 U. S. P. units of vitamin D.

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1944, p. 608).

The following dosage forms have been accepted:

CARROLL DUNHAM SMITH PHARMACAL COMPANY, ORANGE, N. J.

Tablets Thiamine Hydrochloride: 1 mg., 5 mg. and 10 mg.

Solution Thiamine Hydrochloride, 10 mg. per cc.: 1 cc. ampul and 30 cc. vials. Each cubic centimeter contains thiamine hydrochloride 10 mg. in isotonic solution of sodium chloride, preserved with 0.5 per cent chlorobutanol.

TETANUS TOXOID, ALUM PRECIPITATED (See New and Nonofficial Remedies, 1944, p. 565).

The following additional dosage form has been accepted:

GILLILAND LABORATORIES, INC., MARIETTA, PA.

Tetanus Toxoid, Alum Precipitated (Refined): 50 cc. vials (25 immunizations) and 50 cc. vials (50 immunizations). Preserved with merthiolate 0.01 per cent.

SULFAMERAZINE (See THE JOURNAL, May 6, 1944, p. 31).

The following dosage form has been accepted:

E. R. SQUIBB & SONS, NEW YORK

Tablets Sulfamerazine: 0.5 Gm. and 0.25 Gm.

SULFATHIAZOLE (See New and Nonofficial Remedies, 1944, p. 191).

The following dosage form has been accepted:

PREMO PHARMACEUTICAL CO., INC., NEW YORK

Tablets Sulfathiazole: 0.5 Gm.

METAMUCIL (See THE JOURNAL, April 15, 1944, p. 1133).

The following additional dosage forms have been accepted:

G. D. SEARLE & CO., CHICAGO

Metamucil: 4 ounce and 16 ounce containers.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO 10, ILL.

Cable Address : : : : "Medic, Chicago"

Subscription price : : : : Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, OCTOBER 7, 1944

HUMAN TOXOPLASMOSIS

The protozoan parasite *Toxoplasma* was discovered in the gundi, a North African rodent, by Nicolle and Manceaux in 1909. Protozoologists have found that *Toxoplasma* is pathogenic for a wide variety of mammals and possibly birds and has an extensive geographic distribution. Although the existence of a large potential reservoir of natural hosts, including dogs, rabbits, squirrels and voles, was known, the first verified human case of toxoplasmosis was reported by Wolf, Cowen and Paige¹ in 1939, just thirty years after the discovery of toxoplasma.

Once the pathogenicity of the parasite for man had been proved, reports of cases of human toxoplasmosis rapidly began to appear in the literature. Wolf and his associates² alone reported 9 more cases in the surprisingly short period of three years. Their pioneer studies established the basic features of infantile toxoplasmosis. They were dealing with a disease of young infants, in several instances proved to be acquired in utero and characterized by convulsions, changes in the cerebrospinal fluid, hydrocephalus, multiple calcifications in the brain and involvement of the retina by focal destructive lesions. In patients who survived the acute stage they found persisting or increasing hydrocephalus, nystagmus and permanent impairment of vision and usually some degree of mental retardation. They were much impressed with the destructive and granulomatous lesions in the central nervous system and retina but occasionally found lesions or parasites in extraneural tissues.

Meanwhile in 1940 and 1941 Pinkerton and his associates³ had reported 3 cases of fatal toxoplasmosis in adults with a different clinical picture resembling

typhus and Rocky Mountain spotted fever. But little involvement of the brain appeared in these cases. The main pathologic changes were diffuse interstitial pneumonia and necrotic and inflammatory lesions in many organs. Wolf and his associates encountered similar lesions only once, in a 3 day old infant, and speculated on the possibility of aspiration of toxoplasma infected amniotic fluid to account for the severe pulmonary lesions.

While there is on the surface little similarity between the acute typhus-like disease of adults and the encephalomyelitis of infants, the extraneural lesions occasionally found in infants indicate a pathogenic mechanism common to the two. Sabin⁴ had studied the pathogenesis of experimental toxoplasmosis and had shown that following multiplication at the site of entry the parasites are disseminated through the blood stream to every tissue, invading the vessel walls and ultimately the tissues themselves. The involvement of different tissues depends mainly on their susceptibility, regardless of the port of entry of the infection. In human fetuses and infants the central nervous system is especially susceptible. In a recent study based on 3 new cases of infantile toxoplasmosis, Zuelzer⁵ points out, however, that extensive changes in the visceral organs of infants may be more common than was formerly assumed. He found widespread lesions, including a severe myocarditis and interstitial pneumonia, besides encephalomyelitis, in an infant which died in the acute stage of the disease, and he was able to demonstrate minute residual lesions in the cardiac and skeletal muscles of a second patient with advanced cerebral and retinal damage. Zuelzer explains the pneumonia by the fact that all parasites must pass through the lungs during the stage of invasion. He states that the extent of the lesions found in the visceral organs depends largely on the stage of the disease. In most of the infantile cases the dissemination of the parasites occurs in utero some time before birth and thus the acute stage of invasion remains hidden. The lesions caused by toxoplasma tend to heal and may largely have disappeared by the time of birth except for the changes in the brain and retina, where the inability of nerve cells to regenerate allows conspicuous permanent lesions to develop. When the infection occurs shortly before delivery or after birth and the stage of invasion can be observed, the clinical manifestations may be expected to be more variegated and the disease more closely resembles adult toxoplasmosis. Further observations are needed before the complete picture of the disease can be drawn.

Early observations indicated that the mothers of infants with congenital toxoplasmosis fail to show evidence of the disease themselves. This was explained

1. Wolf, Abner; Cowen, David, and Paige, Beryl H.: Toxoplasmic Encephalomyelitis, *Am. J. Path.* 15: 657 (Nov.) 1939.

2. Paige, Beryl H.; Cowen, David, and Wolf, Abner: Toxoplasmic Encephalomyelitis, *Am. J. Dis. Child.* 63: 474 (March) 1942. Cowen, David; Wolf, Abner, and Paige, Beryl H.: Toxoplasmic Encephalomyelitis, *Arch. Neurol. & Psychiat.* 48: 689 (Nov.) 1942.

3. Pinkerton, Henry, and Weinman, David: Toxoplasma Infection in Man, *Arch. Path.* 30: 374 (July) 1940. Pinkerton, Henry, and Henderson, R. G.: Adult Toxoplasmosis, *J. A. M. A.* 116: 807 (March 1) 1941.

4. Sabin, A. B.: Toxoplasmosis, in De Sanctis, A. G.: *Advances in Pediatrics*, New York, Interscience Publishers, Inc., 1942.

5. Zuelzer, W. W.: Infantile Toxoplasmosis, *Arch. Path.* 35: 1 (July) 1944.

after Sabin⁴ had perfected a serologic method permitting the demonstration of specific serum antibodies against toxoplasma not only in the patients but several times in their mothers and sometimes in other members of the family. Now it is clear that older persons may have subclinical toxoplasma infections. These findings at once widened the scope of future investigations. In the last five years 27 cases of human toxoplasmosis were reported in the continental United States. The presence of specific antibodies in apparently healthy persons means that the true incidence of human toxoplasmosis may be far greater than the number of clinically or pathologically recognizable cases indicates. This problem must await the development of a simplified method for the serologic diagnosis of the infection. The present method of Sabin seems reliable but not suited to general use.

Toxoplasmosis is rapidly becoming a disease of general interest. Search among the inmates of institutions for the mentally deficient has already yielded a number of previously unrecognized cases. The disease constitutes a known cause of mental retardation and of chorioretinitis. It concerns the neurologist, the ophthalmologist, the pediatrician, the pathologist and the general practitioner.

Much work remains to be done. The life cycle of *Toxoplasma* is as yet incompletely understood. Its exact classification is uncertain and the natural mode of transmission is obscure. Adequate epidemiologic studies are lacking. The question of vectors has not been investigated. Future studies will show the extent of the problem of toxoplasmosis. Any attack on the disease will have to be along the lines of prevention, since therapy will have little to offer once the irrevocable destruction of brain and retina has taken place.

PENICILLIN EXCRETORY BLOCKADE

Florey,¹ Rammelkamp² and others have shown that within an hour after penicillin administration by the intravenous route fully 60 per cent of the injected dose is excreted in the urine. By the end of this time the penicillin concentration of the blood stream falls to zero. Frequent reinjections are therefore necessary to maintain an adequate therapeutic concentration in the blood stream. Diodrast, hippuran and other substances that are known to be excreted mainly by the renal tubules exhibit a similar rapidity of elimination, suggesting the probability that, in addition to being filtered through the glomeruli, penicillin is also excreted in large measure by the renal tubules. If so, the rapid urinary loss could be prevented by therapeutic blockade of the tubular excretory function.

A theoretical basis for such blockade is furnished by the well known mutual depression of tubular excretion by competing chemical agents.³ When such substances as diodrast, hippuran, phenol red and other similar derivatives are given simultaneously a manifest reduction in the rate of excretion of all injected substances occurs, presumably because of their competition for elimination through a common mechanism. Rammelkamp and Bradley⁴ of Boston University School of Medicine therefore tested the effects of simultaneous injection of penicillin and diodrast on clinical patients. The rate of renal elimination was first measured after a single control intravenous injection of 5,000 Oxford units of penicillin. Twenty-four hours later the same patients were given a simultaneous intravenous injection of 5,000 Oxford units and 30 cc. of diodrast. The control 60 per cent excretion of penicillin by the end of one hour was reduced to 20 per cent as a result of the simultaneous injection of diodrast. In the control test the initial penicillin titer of the blood serum fell from 0.312 unit per cubic centimeter to practically zero by the end of forty minutes. As a result of diodrast blockade the forty minute reading was 0.039 unit per cubic centimeter. The average control penicillin excretion of all patients was 57.2 per cent of the injected dose by the end of four hours, which was reduced to 32 per cent as a result of diodrast blockade.

Beyer and his associates⁵ of the Department of Pharmacology and Bacteriology, Medical Research Division, Sharp and Dohme, Inc., Glenolden, Pa., have recently tested a second blocking substance, p-aminohippuric acid. This substance was selected because it has remarkably low toxicity. In a typical control test 10,000 Oxford units of penicillin was injected intravenously as a single dose into a nonanesthetized trained dog. In the blockade test p-aminohippuric acid was infused simultaneously with the penicillin. Recovery of penicillin in the urine when p-aminohippuric acid was not administered averaged 78 per cent of the injected dose, falling to a 33 per cent recovery as a result of p-aminohippuric acid blockade. With blockade the plasma concentration does not fall below 0.2 unit per cubic centimeter by the end of two hours, with a two hour zero plasma concentration in the control nonblockade test.

Forty-eight hour experiments were performed on anesthetized dogs, during which both penicillin and p-aminohippuric acid were infused continuously, the infusion rate of the penicillin being 15 units per minute. In the nonblockade control test the plasma titer did not rise above 0.02 unit of penicillin per cubic centimeter during the forty-eight hours. In the blockade test the

1. Florey, H. W.; Abraham, E. P.; Chun, E.; Fletcher, C. M.; Gardner, A. D.; Heister, N. G.; and Jennings, M. A. *Lancet* 2:177, 1941.

2. Rammelkamp, C. H., and Keefer, C. S. *J. Clin. Investigation* 22:425, 1943.

3. Smith, H. W., Goldring, W., and Chasis, H. *J. Clin. Investigation* 18:263, 1938. Finkelstein, N., Alimino, L., and Smith, H. W. *Am. J. Physiol.* 133:276, 1941.

4. Rammelkamp, C. H., and Bradley, S. E. *Proc. Soc. Exper. Biol. & Med.* 53:30, 1943.

5. Beyer, K. H., Woodward, R., Peters, L., Verwey, W. F., and Mattis, P. A. *Science* 100:107 (Aug. 4) 1944.

titer rarely fell below 0.1 unit per cubic centimeter, a fiftyfold increase in average plasma titer. There appeared to be no pathologic effects attributable to the forty-eight hour combined penicillin blockade therapy. In the opinion of Beyer and his associates the combined intravenous administration of penicillin and p-aminohippuric acid is of sufficient therapeutic promise to warrant clinical trial.

SIMPLIFIED THERAPY OF MENINGITIS

Rammelkamp and Keefer¹ found that penicillin injected intravenously is not excreted into the normal cerebrospinal fluid. From this it has been quite generally concluded that it is necessary to treat cases of meningitis by combined intravenous and intrathecal injections of penicillin. According to Rosenberg and his colleagues² of the U. S. Navy Medical Corps, Great Lakes, Ill., this combined treatment has given prompt and effective clinical results. Nevertheless, in their opinion the necessity for such combined therapy has not been established. It has not yet been shown that intravenously injected penicillin is not extravasated in adequate amounts by inflamed cerebrospinal tissues.

Rosenberg and his associates³ therefore injected 20,000 to 40,000 Oxford units of penicillin intravenously or intramuscularly into each of 8 meningitis patients. From 60 to 140 minutes later they withdrew a sample of spinal fluid from each patient for penicillin assay. They found that, contrary to previous expectation, a considerable amount of penicillin is excreted into the spinal fluid of each meningitis patient. The amounts varied with different patients. The lowest titer was 0.03 Oxford unit per cubic centimeter of spinal fluid and the highest titer 0.35 unit (average titer 0.19 unit).

Rammelkamp and Keefer⁴ found that penicillin in human serum in concentrations as low as 0.019 unit per cubic centimeter produces maximum bactericidal effects against *Streptococcus hemolyticus* and that 0.156 unit per cubic centimeter produces maximum bacteriostasis with *Staphylococcus aureus*. From these data Rosenberg concludes that the excretion (or extravasation) of penicillin into the spinal fluid of meningitis patients after intramuscular or intravenous injection of sufficiently large doses is adequate for the control of meningitis due to susceptible organisms, without the necessity of a supplementary intrathecal injection.

Hac⁵ has recently described a similarly increased extravasation or excretion of subcutaneously injected penicillin into experimentally infected skeletal muscles (*Clostridium welchi*).

THE PUBLIC RELATIONS SURVEY OF CALIFORNIA

In *California and Western Medicine* for July appears the report of a public relations survey made for the California Medical Association by the firm of Foote, Cone & Belding. After several pages in which Mr. John R. Little justifies the survey and commends the association for having expended the necessary \$8,000 to secure it, he turns to the recommendations which result from the survey. This investigation yielded an opinion like that of a similar survey conducted previously by the Opinion Research Corporation for the National Physicians' Committee: the public does not object to prepayment plans. In California it did apparently object to the prepayment plan then being conducted by the California Physicians' Service. Mr. Little stated that a plan must be developed which will cover between 3,000,000 and 5,000,000 people in California and that it must be built on the finest standards of American business. For this purpose he indicated two necessities: (1) a splendid business executive administrator who must be from business and not from medicine or an allied profession and (2) the creation of a new public relations department to deal with the members of the California Medical Association and county medical societies throughout the state, this also to be headed by a layman. Finally, Mr. Little recommended that all councils in the California Medical Association and in the several county societies be divided into three groups responsible respectively for (1) progress of scientific medicine, (2) medical economics and (3) public relations.

The maintenance of medical standards in medical education and medical practice, the observation of medical ethics in medical practice and the maintenance of the personal relationship between doctor and patient, which have long been considered fundamental to the quality of medical care, are ideals understood by physicians. Economists, sociologists, business executives and insurance agencies seem to have had but little sympathy with these ideals in the past. Mr. Little, in his recommendations to the California Medical Association, follows the line long emphasized by Michael Davis, Isadore Falk and others that the profession of physicians demands merely that he practice medicine and that the terms of his practice, the nature of the distribution of medical service and the conditions of the relationship of the doctor to the hospitals, the clinics, the health centers and similar agencies may well be left to economists and business administrators. Exactly what the California Medical Association will do to make Mr. Little's report effective is not yet apparent.

Mr. Little has apparently been endeavoring to define trends, with the point of view that doctors ought to observe trends and go along with them. There are, however, both favorable and unfavorable trends from the point of view of medical practice. Long ago a

1. Rammelkamp, C. H., and Keefer, C. S.: *Am. J. M. Sc.* **205**: 343, 1943.

2. Rosenberg, D. H., and Arling, P. A., to be published.

3. Rosenberg, D. H., and Sylvester, J. C.: *Science* **100**: 132 (Aug. 11) 1944.

4. Rammelkamp, C. H., and Keefer, C. S.: *J. Clin. Investigation* **22**: 423, 1943.

5. Hac, L. R.: *J. Infect. Dis.* **74**: 164, 1944.

medical philosopher urged physicians to observe well the trend of the disease, and if it be upward and toward health, then to aid the trend and go with it toward recovery; but if the trend be downward and toward death, then the physician should interfere so that he may, if possible, reverse the trend. If there were but one way in which the people could secure a high quality of medical service at a low cost, the problem of the medical profession at this time would be exceedingly simple. There are, however, many different approaches to this problem. There is the former technic of the California Physicians' Service and the changed plan. There are similar but in some respects different plans already in effect in other states. There are the technics now being developed by a variety of private insurance agencies in cooperation with large industries. There is the plan of Mr. Henry Kaiser. There is the possibility of compulsory sickness insurance on a county, a state or a national basis. The most important fact that comes out of Mr. Little's survey is that people in California were not satisfied with the California Physicians' Service up to the time of his survey and that changes seemed to be necessary to satisfy the people. Whether these changes when made will be satisfactory will remain, of course, for time and the California Medical Association to determine.

Current Comment

THE RED CROSS MEDICAL COMMITTEE

This week the American Red Cross announced through its new chairman, Mr. Basil O'Connor, the appointment of a special Medical and Health Committee to survey current Red Cross operations of a medical and health character and to recommend plans for the postwar period. The membership of the committee includes:

Dr. Lewis H. Weed, chairman, Washington, D. C., Division of Medical Sciences, National Research Council.

Dr. Felix J. Underwood, vice chairman, Jackson, Miss., president, American Public Health Association.

Dr. George Baehr, New York, director of clinical research, Mount Sinai Hospital.

Dr. Wilburt C. Davison, Durham, N. C., dean and professor of pediatrics, Duke University School of Medicine.

Dr. Morris Fishbein, Chicago, Editor, THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Dr. Alan Gregg, New York, director of the medical sciences, Rockefeller Foundation.

Major Gen. Norman T. Kirk, Washington, D. C., Surgeon General of the U. S. Army.

Dr. Frank H. Lahey, Boston, national chairman of the directing board, Procurement and Assignment Service for Physicians, Dentists, Veterinarians, Nurses and Sanitary Engineers, Lahey Clinic.

Dr. Roger I. Lee, Boston, President-Elect, American Medical Association.

Vice Admiral Ross T. McIntire, Washington, D. C., Surgeon General of the U. S. Navy.

Dr. Thomas Parran, Washington, D. C., Surgeon General of the U. S. Public Health Service.

Dr. Henry R. Viets, Boston, will act as secretary of the committee. In making his announcement Mr. O'Connor said:

Medical and health problems touch virtually every aspect of Red Cross activities, whether in terms of disaster relief, nursing, accident prevention, nutrition or blood donations. Because of this vital relationship to the general Red Cross program, I have asked eleven prominent medical and health experts to serve as a special committee to survey what we are doing currently, analyze the results achieved and give me a blueprint of possible Red Cross activities in these fields in the postwar period. The group appointed was chosen because of their familiarity with operations of the American Red Cross in the medical and health fields.

The medical profession may await with interest the reports of this group. The blood donor service, the nursing services, the nutrition, first aid, disaster relief activities, the home services and those functions dealing with medical supplies all come closely to problems that affect the medical profession. Chairman Basil O'Connor merits commendation for having enlisted medical interest and sought competent advice in developing the innumerable medical activities of the American Red Cross.

WILLIAM GILBERT—PHYSICIAN TO QUEEN ELIZABETH

William Gilbert, who was physician to Queen Elizabeth and James I of England, was born about four hundred years ago. The place of Gilbert in the medical world has been described recently by Sir Walter Langdon-Brown.¹ Gilbert's influence on the medical profession of his day was profound: he insisted on observation and experiment, and he scorned reliance on mere authority; he demonstrated hatred for sham and quackery and was far in advance of his times in condemning some of the extraordinary prescriptions of the day. He recognized the value of iron "as a fine powder steeped in the 'sharpest vinegar' and dried, for the treatment of anemia." While remaining prominent in medicine, Gilbert demonstrated a notable versatility. His masterpiece, "De magnete," has become recognized as a great pioneer work on magnetic and electrical experiment; he has been called "the father of the sciences of geomagnetism and electricity."²

INTRANASAL VACCINATION FOR COLDS

Studies on the possible value of bacterial vaccines for the prophylaxis of the common cold continue. Now Cowan and Diehl¹ report observations on three groups of students given different types of "cold" vaccine administered intranasally by atomizer and one comparable control group similarly receiving a sterile isotonic solution of sodium chloride containing merthiolate 1:20,000 and just enough fluorescence to render the solution faintly colored and turbid. Significant differences in severity or duration of colds or in frequency of complications between the groups were not observed. Thus this carefully controlled study of intranasal vaccination fails to furnish any evidence of the value of intranasal vaccination for colds.

1. Langdon-Brown, Sir Walter: *Nature* 154:136 (July 29) 1944.

2. Chapman, Sydney: *Nature* 154:132 (July 29) 1944.

1. Cowan, D. W., and Diehl, H. S. *Ann. Otol., Rhin. & Laryng.* 53:286 (June) 1944.

MEDICINE AND THE WAR

ARMY

AVIATION MEDICAL EXAMINERS

Graduating exercises were held at the School of Aviation Medicine, Randolph Field, Texas, on July 26, following completion of the course for aviation medical examiners. The list of medical corps students graduating follows:

ALABAMA

John R. Chapman, Captain, Good Water

CALIFORNIA

Albert N. Anton, Captain, Los Angeles
George E. Beckerman, Captain, Santa Monica
Lewis T. Bullock, Major, Los Angeles
Rex N. Carr, 1st Lieut., San Mateo
Lee D. Fulton, Captain, San Francisco
Alfred E. Gardner, 1st Lieut., Ignacio
Robert W. King, Captain, San Jose
Charles I. Morris, Captain, San Francisco
Seymour A. Spungin, Captain, Los Angeles
Ernest M. Stanton, 1st Lieut., Santa Monica
Orville O. Witherbee, Captain, Los Angeles

COLORADO

Orin M. Stout, Major, Denver

DISTRICT OF COLUMBIA

Francis T. Coleman, Major, Washington
Abraham B. Mincosky, 1st Lieut., Washington

FLORIDA

Francis T. Holland, Captain, Tallahassee
John L. Jennings Jr., Captain, Boca Grande
James E. Kendrick, 1st Lieut., Homestead

GEORGIA

Ottis E. Hanes, Captain, Atlanta
James M. Sutton Jr., Major, Sylvestor

ILLINOIS

John I. Brewer, Lieut. Col., Chicago
George J. Cooper, Captain, Chicago
Philip Lerner, Captain, Chicago
Clifford H. Peters, Captain, River Forest
William C. Scott, Captain, Elkhart
Carel van der Heide, Captain, Chicago

INDIANA

John W. Humphreys, Major, Vincennes
Edward C. Lidikav Jr., Captain, Logansport
Thomas O. Middleton, 1st Lieut., Vincennes
Robert H. Williams, Captain, Anderson

IOWA

Edward F. Anderson, Captain, Dubuque
Walford D. Marrs, Captain, Tabor

KANSAS

Shirley E. Clark, 1st Lieut., Rush Center
Arnold H. Janzen, Captain, Butler
Darwin C. Reed, Captain, Wichita
Eldee L. Schneider, 1st Lieut., Dodge City

KENTUCKY

Robert C. Biteman, Captain, Springfield
William C. Buschemeyer, Captain, Louisville

LOUISIANA

William H. Byrne, Captain, New Orleans
Joseph D. Kinn, Captain, New Orleans
William T. Yates, 1st Lieut., Baton Rouge

MAINE

Paul V. Davis, Major, Bridgton

MASSACHUSETTS

Donald V. Baker Jr., 1st Lieut., Uxbridge
John K. Brines, Captain, Wellesley
Henry C. Thacher, Captain, Yarmouth Port

MICHIGAN

Thomas E. Gibson, Major, Ithaca
Warren V. Hinshaw, Captain, Adrian
Alfred E. Thomas Jr., Captain, Detroit

MINNESOTA

Carl L. Lundell, 1st Lieut., Cloquet

MISSISSIPPI

Robert G. Head, Captain, Meridenhall

MISSOURI

Francis O. Trotter Jr., 1st Lieut., Kansas City

NEBRASKA

Verne H. Alder, Captain, Omaha
Robert J. Morgan, 1st Lieut., Alliance
Claude W. Otto, 1st Lieut., Aurora
Ward A. Peterson, Captain, Omaha
Alvin F. Sonnenberg, Captain, Lincoln
Laverne D. Sprague, 1st Lieut., Omaha

NEW HAMPSHIRE

Frank D. Flakovich, Major, Troy

NEW JERSEY

Joseph A. Buchignani, Captain, Newark
Maurice P. Charnock, Major, Trenton
Charles Kliegerman, 1st Lieut., Atlantic City

NEW MEXICO

Daniel H. Cahoon, Captain, Roswell

NEW YORK

Louis F. Bishop Jr., Lieut. Col., New York
Homer T. R. Bull, Captain, Geneseo
Alvin M. Cahan, Captain, New York
Ward V. Ceilly, Major, Brooklyn
Clyde K. Conrad, Major, Chappaqua
Cornelius J. Dwyer Jr., Captain, Brooklyn
Samuel Feinberg, Captain, Port Jefferson
Allan L. Friedlich Jr., 1st Lieut., New York
Jack H. Galen, 1st Lieut., Brooklyn
Roger H. George, Captain, Verona
Bernard C. Glueck Jr., Ossining
George Goldstein, Captain, Brooklyn
Basel C. Gray, Captain, New Berlin
Max S. Konigsberg, Captain, New York
Sidney Kreinin, Major, Brooklyn
Irving L. Leff, Captain, Kew Gardens
William W. Pierce, Major, Gasport
Bradley W. Prior, 1st Lieut., Buffalo
Shepard Quinby, Major, Hamburg
John R. Roche, Major, Laurelton
Irving M. Rollins, 1st Lieut., Forest Hills
Robert S. Siffert, 1st Lieut., Brooklyn
Willard L. Smith, 1st Lieut., White Plains
John M. Tortora, Captain, Brooklyn

NORTH CAROLINA

Thomas E. Andes, Captain, Lerksville
Henry Lihn, Captain, Fairmont
William C. Parks, 1st Lieut., High Point

OHIO

Alfred W. Erb, Captain, Piqua
William M. Garrett, Captain, Frankfort
Gordon H. Hammill, Captain, Euclid
John A. Kramer, Captain, Columbus
Thomas E. Miller, Captain, Iron ton
Frank D. Novy, Captain, Euclid
Samuel M. Schall, 1st Lieut., Toledo
Carl F. Schilling, 1st Lieut., Cincinnati
Frederick S. Spiegel, Captain, Cincinnati
Ralph W. Tapper, 1st Lieut., Dayton
Robert E. Tschantz, Captain, Hartsville

The following officers are in the Colombian army:

Pafael Arturo B.tero, Captain,
Luis A. Gomez, Major

In addition there was one member of the Medical Corps of the Chilean Air Force, Lieut. Col. Luis C. Vivian.

OKLAHOMA

Hillard F. Denyer, Major, Chandler
James W. Downey, 1st Lieut., Chickasha
Ralph W. Morton, Captain, Sulphur
Leonidas W. Payne, Major, Pauls Valley
Harold B. Witten, Captain, Harral

OREGON

Richard W. Leong, 1st Lieut., Portland

PENNSYLVANIA

Edward R. Deveson, Captain, Pittsburgh
Milton H. Graditor, Captain, Conansburg
Newton W. Hershner Jr., Captain, Mechanicsburg
John M. Hieckes, 1st Lieut., Glassport
Eugene C. Jameson Jr., Captain, Philadelphia
Thaddeus A. Nighorowicz, 1st Lieut., Gallitzien
Frank T. O'Brien, 1st Lieut., Scranton
John J. O'Keefe, Major, Bith Cynwyd
Lmle E. Reiss Jr., Captain, Pittsburgh
Henry Rothkopf, Captain, Philadelphia
William L. Schaefer Jr., 1st Lieut., Middletown
William I. Westcott, Captain, Doylestown

TEXAS

George W. Berry, 1st Lieut., San Antonio
Richard E. Nicholson, 1st Lieut., Dallas
Fred P. Robbins, Captain, Randolph Field
Gus C. Yelderman, Major, Rosenberg

VIRGINIA

Charles R. Mills, Captain, Bristol
Hugo A. Sacchet, 1st Lieut., Clifton Forge

WASHINGTON

Ralph M. deBit, Captain, Kennewick

WEST VIRGINIA

James R. Goodson, 1st Lieut., Davis

WISCONSIN

Richard D. Champney, Captain, Milwaukee
William B. Cheeseman, 1st Lieut., Madison
Edward Zamil, Captain, Milwaukee

ARMY AWARDS AND COMMENDATIONS

Colonel Clifford V. Morgan

The Legion of Merit award was recently presented to Col. Clifford V. Morgan of Washington, D. C., for "services in the Office of the Undersecretary of War from September 1940 to March 1942. As chief of the Commodities Division, Resources Branch, and its representative in the Army and Navy Munitions Board, he was charged with the responsibility of determining the needs of the armed services and of essential industries for strategic, critical and essential materials required for the vastly expanded production program, and, according to the degree of their scarcity, to initiate measures designed to insure their proper and most efficient allocation. As the emergency became more acute he, because of his comprehensive grasp of the entire munitions problem, his executive ability, powers of perception and analysis, and his great tact in securing adjustments with the numerous boards and committees of other agencies of the government and with authorized representatives of industry, contributed materially to insuring supplies of the vitally needed materials without which the expanded war production program could not have been accomplished." Dr. Morgan graduated from the University of Nebraska College of Medicine, Omaha, in 1927 and has been in the service since August 1928.

Major Edward A. Kelly

The Silver Star was recently awarded to Major Edward A. Kelly, formerly of Washington, D. C. The citation states that Major Kelly, who was assigned to the ship's hospital, "distinguished himself when, after the ship had received a direct hit by an aerial bomb, he administered medical aid to wounded personnel under risk to his own life. The bomb had smashed the ship's dispensary, and he engaged in giving aid to the wounded on the decks despite confusion and pandemonium caused by the explosion and the resulting fire, smoke and escaping steam. As the ship began to list he carried many wounded men from the starboard to the port side, inflated their life belts and lowered them into the water by means of ropes.

He continued to work until practically all living personnel were evacuated. Major Kelly was taken into a lifeboat after four hours in the water and, in the lifeboat rendered medical aid to wounded there and helped load them aboard a rescue ship. When he was taken on the rescue ship he resumed the task of giving medical aid and worked steadily until all the wounded were cared for, eleven hours after the troopship had been hit. His absolute devotion to duty in the face of danger and under extremely difficult conditions are consonant with the fine traditions of the American military service." Dr. Kelly graduated from Georgetown University School of Medicine, Washington, D. C., in 1934 and entered the service June 20, 1942.

BRUNS GENERAL HOSPITAL BECOMES
TUBERCULOSIS CENTER

The Bruns General Hospital, Santa Fe, N. M., under the command of Brig. Gen. Larry B. McAfee, has been designated as an army center for the treatment of tuberculosis. The hospital is specially staffed with tuberculosis experts and utilizes the most modern equipment and methods of treatment. Bruns General Hospital was named in honor of Col. Earl Harvey Bruns, who was one of the most distinguished phthisiologists in the history of the Army. As chief of medical service at Fitzsimons General Hospital, Denver, which is also an army tuberculosis center, he introduced much of the therapeutic practice now in effect there and trained many officers in the principles of tuberculosis control.

APPOINTED POST SURGEON

Major Nicholas R. Locascio, formerly of New York City, has been appointed post surgeon and commanding officer of the Army Station Hospital at Pine Camp, New York, succeeding Col. Dunlap P. Penhallow. In active service in the Reserve Officers Corps since 1931, Dr. Locascio reported for active duty June 2, 1941. He entered the service with the rank of captain in 1935 and was promoted to major in 1942.

MISCELLANEOUS

NEUROPSYCHIATRY IN THE
JAPANESE ARMY

Interview at the Japanese Prison Camp, Blue
Beach, Cape Gloucester, New Britain,
with Dr. Otsuko Hideo

Lieutenant Commander T. E. Newell (MC), U.S.N.R.

(Interpreter, 2d Lieut. Harry T. Foote, U.S.M.C.R., Japanese
Interpreter Section, Division Intelligence Section,
First Marine Division)

Dr. Otsuko is 31 years of age, intelligent, cooperative and congenial. His home is in Tokyo, Japan, where he graduated from medical school at the Imperial University in 1940. Following his four year course in medicine he interned one year in a civilian hospital. He then practiced general medicine in civil life for one and one-half years in Tokyo. I explained that I wished to get information about methods used in psychiatry in the Japanese military forces. He was cooperative in every way.

He has been in military service three years in the army, the first nine months in Japan, then in the Philippines and Rabaul. He spent one year in a military base hospital. He went to Rabaul during January 1943 and for six months was assigned to duty in a field hospital. In the Philippines and Rabaul he was attached to the 1st battalion, 141st Infantry Regiment, but since then he has been in smaller field hospitals. His recent duty has been at Borgan Bay. During battles he has always worked in field hospitals and not on the front lines.

His knowledge of military medicine seemed good and he has apparently had first hand knowledge of subjects on which he was interrogated. His answers were usually prompt, but at times he would think a moment or two before answering to be sure he was right. Very few of the Japanese prisoners with him have seemed reluctant to give us any information desired. They have careful screening of mentally unstable men in Japan

before they are sent to foreign duty. This is carried out by trained psychiatrists. They may not be specialists in psychiatry but they usually have at least the rank of major.

Three to 7 per cent of military men are eliminated in Japan because of mental instability. They have "very few neurotics, almost none." He admits some, maybe 1 in 100 or less. As the interview progressed, it was clear that it was a problem with the Japanese as it is with other people.

Disposition of war neurosis cases in the Japanese army is quite similar to that in the German armies in the last war. They are segregated immediately to protect and help the patients themselves and also to prevent a bad influence on their comrades. They try to keep them on their duty, but if they are too nervous they are sent back to field hospitals in the immediate vicinity. They are treated by sedatives sufficient to give them rest and sleep. They are held here for three weeks to one month, at least ten days and, at most, two or three months before being sent back to duty or evacuated. From places like Borgan Bay or Cape Gloucester patients needing further care were sent to a hospital at Rabaul. Dr. Otsuko said these measures are taken to prevent the patients from getting "serious" or "very ill." The treatment and the results vary greatly. When good recovery occurs the men are returned as soon as possible but not usually in less than ten days. Others are retained at field and battalion hospitals and are given sedatives as needed and occupational treatment, which consists of light duty, policing hospital areas and such entertainment as can be had. They are given very considerate attention and "no work of the brain." In foreign duty if they do not recover in about three months they are returned to Tokyo military hospitals and put in what are similar to our "N. P." wards.

The doctor wrote in my note book, in English, the term they use for war neurosis, "krieg neurosis," and I assumed it to be named for them by the Germans. This diagnosis is not considered a very complimentary label for a soldier returning as

unfit for further duty, it probably being similar to the term "fear state" advocated by the Australian medical authorities. These men are treated as all war casualties in Japan as "unfortunate individuals" and the patients feel likewise, whether their disability is mental or physical. In rural and suburban areas the attitude is the same as in large cities. The psychoneurotics in Japan are considered as honorably ill as those with malaria or other such diseases. He said "We are good to our war casualties at home."

All military units are taught and lectured to in regard to defending themselves against mental difficulties as they are against physical diseases. Dr. Otsuko says it is a military policy for the commanding officers to note any unusual acts of the men and try to direct their thinking and conduct on the spot. His impression is that there is usually good cooperation in this regard, and results are said to be good. Dr. Otsuko would not admit at any time that these patients are dealt with in a harsh manner. These methods of observation and early treatment of cases are followed out in field hospitals also.

Thirty per cent of these casualties are returned to duty in the field or from field hospitals. This includes those returning to duty from field hospitals and probably from advanced base hospitals at places like Rabaul. Five to 7 per cent go back to Tokyo; the remainder are held for noncombat duty. This non-combat group comprises about 64 per cent of the total. These figures indicate that the average soldier can hope very little for a gain to be derived from developing a neurosis.

Diseased and run down men succumb to psychoneurosis more readily than healthy men. Dr. Otsuko thinks that the greater the hazards of war, the greater the incidence of mental diseases. Men who have long been in combat operations are more often affected than well seasoned troops with less severe war experiences.

They have trained psychiatrists who go from front to front and from hospital to hospital to take into consideration mental problems of personnel in every phase of warfare from front lines back to the advanced base hospitals.

Men discharged from military service because of war neurosis are put back into civil life at farms or other home jobs available and suitable. Special efforts are being made to rehabilitate these men and get them into suitable occupations.

After the interview the doctor asked that he be given some real nice biscuits and some real butter. He has been allowed special privileges over the other prisoners and to eat apart also. He was given some special foods the boys had on hand but unfortunately the boys had no biscuits.

NEW MEDICAL MEMBERS OF STAFF FOR OFFICE OF VOCATIONAL REHABILITATION

The appointments of Dr. Victor H. Vogel, Surgeon, U. S. Public Health Service, as consultant in psychiatry and Dr. Mark E. Gann, Surgeon (R), U. S. Public Health Service, as assistant regional representative are announced by Michael J. Shortley, director, Office of Vocational Rehabilitation, Federal Security Agency, effective September 1.

As a member of the staff of the physical restoration section of the federal office, Dr. Vogel's activities as consultant in psychiatry will include the organization of programs for the rehabilitation of persons with psychiatric disabilities and mental hygiene programs for all handicapped persons who are clients of state rehabilitation agencies. The federal-state grant-in-aid program for the vocational rehabilitation of civilian disabled persons provides for the inclusion of psychiatric diagnosis and treatment, and Dr. Vogel's consultative services will be available to vocational rehabilitation agencies and agencies for the blind in all states, the District of Columbia, Puerto Rico and Hawaii.

Dr. Vogel is a graduate of the University of Colorado Medical School, 1929. He was granted the degree of master of public health at the Johns Hopkins University in 1940 and received postgraduate training in psychiatry at the Colorado Psychopathic Hospital in 1937-1938, and at the Johns Hopkins Medical School in 1939-1940. He is a certified specialist of the National Board of Neurology and Psychiatry and a fellow of the American Psychiatric Association. Dr. Vogel served as

assistant chief, Mental Hygiene Division, and mental hygiene consultant to the states, U. S. Public Health Service, 1940-1942.

Dr. Gann has been assigned to the San Francisco office to assist the state rehabilitation agencies in the inauguration of physical restoration services and to aid in the interpretation of the vocational rehabilitation program to cooperating organizations and professional groups. His services as a consulting medical officer will be available to all states in the western area. Dr. Gann is a graduate of the Johns Hopkins School of Medicine, 1933. He received training in surgery at the Sinai Hospital, Baltimore, in 1933-1938 and engaged in the private practice of general surgery in Baltimore from 1938 to 1943. Prior to his assignment to the Office of Vocational Rehabilitation, Dr. Gann's period of active duty with the U. S. Public Health Service included industrial surgery and participation in the medical care project in the Mobile, Ala., war housing clinics.

PATHOLOGISTS PRESENT MILITARY PROGRAM

It is planned to devote a considerable portion of the 1945 meeting of the American Society of Clinical Pathologists to subjects of primary interest to laboratory officers in the armed forces of the United States, i. e., to military pathology. While the date and place of the meetings are not yet definitely decided, it will most likely be in Chicago about the first week of June.

It is the desire of the program committee that laboratory officers working in military hospitals participate actively in this program. The committee therefore requests that materials which would be of interest for such a program be kept in mind.

If within the course of the next months such materials or data of interest in military laboratory work come to the attention of these laboratory officers and they desire to present them at the 1945 A. S. C. P. meeting, they should communicate directly with Dr. A. S. Giordano, chairman of the Program Committee, American Society of Clinical Pathologists, 531 North Main Street, South Bend, Ind.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in *THE JOURNAL*, September 30, page 307)

CALIFORNIA

Stanford University Hospitals, San Francisco. Capacity, 372; admissions, 9,588. Dr. Anthony J. J. Rourke, Superintendent (resident—surgery, obstetrics and gynecology, anesthesia, psychiatry, medicine, nose and throat).

MICHIGAN

Eloise Hospital and Infirmary, Eloise. Capacity, 6,432; admissions, 7,095. Dr. Charles J. Smyth, Medical Director (3 residents—medicine, November 1).

NEW YORK

Bronx Hospital, New York City. Capacity, 389; admissions, 8,075. Mr. William B. Seltzer, Superintendent (resident—surgery). Mother Cabrini Memorial Hospital, New York City. Capacity, 295; admissions, 2,976. Mother Corinna, Superior (interns).

WASHINGTON

St. Luke's Hospital, Spokane. Capacity, 236; admissions, 4,699. Mr. Gordon W. Gilbert, Administrator (interns).

WEST VIRGINIA

Kanawha Valley Hospital, Charleston. Capacity, 165; admissions, 4,414. Dr. G. B. Capitol, President (1 intern, 1 resident—mixed service). St. Mary's Hospital, Clarksburg. Capacity, 192; admissions, 4,201. Sister M. de Sales, Administrator (2 residents—mixed service).

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Mayo General Hospital, Galesburg, Ill.: High Blood Pressure, Drs. Adrien H. P. E. Verbruggen and Louis N. Katz, October 18.

Camp Ellis, Camp Ellis, Ill.: Diseases of the Intestinal Tract, Drs. Warren H. Cole and Michael H. Streicher, October 18.

Chanute Field, Rantoul, Ill.: Thrombosis, Thrombophlebitis and Anticoagulants, Col. Irving S. Wright, October 18.

ORGANIZATION SECTION

WASHINGTON LETTER (From a Special Correspondent)

Oct. 2, 1944.

Intensified Venereal Disease Control During Demobilization Discussed

Action of the War Advertising Council in withdrawing its support from the Antivenereal Disease Campaign of the U. S. Public Health Service, because of its "highly controversial nature" and evidence that the drive was "repugnant to many Catholic organizations," received no direct comment from the National Venereal Disease Committee today. The Federal Security Agency, however, has revealed that the campaign has just been explored again fully, with a Catholic committeeman in attendance. Indications were that efforts against the disease are to be intensified in spite of this negative step by one of the important supporting organizations. At the second meeting of the National Venereal Disease Committee, just completed, plans were further explored to keep the disease in check during the demobilization period. The meeting dealt primarily with steps to be taken to reduce the estimated 5,000,000 civilian venereal disease cases and to cut infection rates among military personnel.

The meeting dealt comprehensively with the problem, Lieut. Col. Thomas H. Sternberg discussing the Army aspect, Commander S. H. Schwartz that of the Navy; Dr. J. R. Heller, Bethesda, Md., assistant surgeon of the Division of Venereal Diseases of the U. S. Public Health Service, medical developments; A. E. Kimberling, Louisville, Ky., chief of police, law enforcement technics; Chief of Police Fred Roff of Morristown, N. Y., views of the International Association of Chiefs of Police; Rt. Rev. Howard J. Carroll, assistant general secretary of the National Catholic Welfare Conference, outlining religious aspects of the venereal disease problem, and Dr. William F. Snow, New York, of the American Social Hygiene Association, stressing the need of public education.

La Guardia Describes New York City Health Problems

Mayor Fiorella La Guardia was to describe health problems of New York City when he appeared as a witness this week before the Kelley Committee investigating Aid to the Physically Handicapped, slated to continue through October 2, 3 and 4 at the Federal Court House in New York. The hearing promised many notable developments, according to the chairman, Congressman Augustine B. Kelley of Pennsylvania, who announced that other witnesses include Miss Helen Keller; Arde Bulova, who has endowed a school to train disabled veterans in watch making; Dr. Ernest Stebbins, New York City commissioner of health; Mrs. Anna Rosenberg of the War Manpower Commission, and Dr. Peter Irving, secretary of the Medical Society of the State of New York. The committee moves on to Pittsburgh on October 17 and 18, when industrial health will be investigated. Also called are Robert Lansdale, commissioner, New York State Department of Social Welfare; G. Samuel Bohlin, chief, Bureau of Vocational Rehabilitation; Holland Hudson, secretary, National Council on Rehabilitation; Robert P. Lane, director, Welfare Council of New York City; Charles E. Hoppin, New York State Veterans Commission; Clarence D. O'Connor, superintendent, Lexington School for the Deaf; Michael J. Murphy, New York State Department of Labor; Dr. Herbert J. Stack, director, Center of Safety Education, New York University; Edward Hochhauser, executive director, Committee for the Care of Jewish Tuberculous, Inc.; Dr. Haven Emerson, DeLamar Institute College of Physicians and Surgeons, Columbia University; Miss Ann Lehman, consultant on the handicapped, United States Employment Service; Col. John Smith Jr., director, Institute for Crippled and Disabled; Miss Frances E. Moscrip, inspector, Classes for the Blind, Board of Education, Brooklyn.

Need of Safeguarding War Workers' Health Emphasized

The War Manpower Commission proposes to continue all possible efforts to safeguard the health of war workers as a means of cutting down absenteeism and increasing labor productivity, War Manpower Commission Chairman Paul V. McNutt emphasizes. He declared that there will be no letdown in War Manpower Commission cooperation in the United States Public Health Service program for war workers. Health standards must be maintained in all war plants engaged in producing equipment urgently needed by the Army and Navy, he said.

Evaluating accomplishments in the joint program up to date, he said that investigations had been conducted at 11,000 war plants in twenty-eight states. These had resulted in many recommendations for correction of poor health conditions affecting war workers. On March 1 he reported 162 projects for new hospitals, 409 for hospital additions and 377 for nurses' homes and training facilities; 254 projects for health centers had been investigated and recommended to the Federal Works Agency. Manpower utilization consultants in the field, he said, would be held responsible for reporting to the U. S. P. H. S. on safety and health programs in all war plants, particularly those of "must" plants. A simplified guide helps consultants to spot health problems. A thumb rule approach is given to such safety and health matters as accident and illness prevention through programs of industrial hygiene, hospital and health center assistance, inplant medical and dental services, promotion of sanitary services, mosquito control and anti-venereal disease campaigns.

MEDICAL ECONOMIC ABSTRACTS

INDIANA PREPARES PREPAYMENT PLAN

The 1943 meeting of the house of delegates of the Indiana State Medical Association appointed a permanent study committee on health insurance, which submits its first report for the 1944 meeting of the house of delegates.

The committee "has arrived at the conclusion that the best present solution is the adoption of a state medical association sponsored plan for prepayment for medical service."

Owing to deficiencies in the nonprofit statutes of Indiana and the lack of a special enabling act, "it will undoubtedly be necessary to organize under the insurance statutes of the state either a mutual or stock insurance company or association in order to carry out the recommended proposed program."

"The plan proposed by your committee would provide:

1. For all professional medical, surgical and obstetric services while the patient occupies a ward or semiprivate hospital bed, including anesthesia, x-ray, laboratory and electrocardiographic services.
2. Emergency surgical services in connection with nonhospitalized injuries for the first twenty-four hours.

"These services will be subjected to the following limitations:

1. "Ten month waiting period for obstetric cases.
2. "No obstetric benefits unless family is enrolled.
3. "X-ray service limited to \$15 in any one year.
4. "Twenty-one days of medical care in any one year."

Joint arrangements are contemplated with the Blue Cross Hospital service of Indiana for a joint enrolment and subscriber relations.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Annual Meeting to Be Held in May.—The annual session of the California Medical Association will be held in Los Angeles, May 6-7, 1945. Tentatively the Hotel Biltmore has been selected as the hotel headquarters.

Two Cases of Leprosy.—California's Health recently reported that 2 persons suffering from leprosy were investigated during June. It was determined that both persons, who had at some time been patients in the U. S. Marine Hospital (National Leprosarium) at Carville, La., are suffering from the disease in an inactive form.

Fund for Needy Physicians.—The Los Angeles County Physicians' Aid Association, which has been conducting a campaign to raise \$250,000 to assist unfortunate physicians, announced recently that the \$50,000 mark had been reached. The association is a nonprofit corporation and is intended to aid needy physicians of the Los Angeles County Medical Association.

Memorial Plans for Founders of Moore-White Clinic.—When six members of the Moore-White Clinic, Los Angeles, return from military service, plans will be launched to establish a foundation for research and to perpetuate the activities of the clinic. The plans include the construction of a new building in memory of the founders, Drs. Melvin L. Moore, Edward C. Moore and Percival G. White. The last survivor of the founders' group, Dr. Edward Moore, died July 10.

Practical Psychotherapy.—A course of eight lectures in practical psychotherapy was opened on Monday, October 2, at Mount Zion Hospital, San Francisco. The course, which will deal primarily with the treatment of neuroses and mild personality problems, will be conducted by Dr. Jacob S. Kasanin, director of the department of psychiatry at the Mount Zion Hospital. The course will be open to senior medical students of the University of California Medical School and Stanford University School of Medicine, the interns and residents in various San Francisco hospitals and public health service and medical officers of the Army and Navy.

ILLINOIS

Chicago

Commander Coggeshall to Address Joint Meeting.—Comdr. Lowell T. Coggeshall (MC) will address a joint meeting of the Institute of Medicine of Chicago and the Chicago Society of Internal Medicine, October 23, at the Palmer House. His subject will be "Current and Postwar Aspects of Tropical Disease Problems."

Memorial to Dr. Gifford.—On October 12 a memorial convocation for Dr. Sanford R. Gifford, professor and chairman of the department of ophthalmology at Northwestern University Medical School, will be held at Thorne Hall on the downtown campus of Northwestern University at 4:30. Dr. Irving S. Cutter will preside at the convocation and Anan Raymond, LL.B., will speak.

Dr. Marrazzi Goes to Wayne University.—Dr. Amedeo S. Marrazzi has resigned as professor and head of the department of pharmacology, Loyola University School of Medicine, effective November 15, to accept a similar position at Wayne University College of Medicine, Detroit. Dr. Marrazzi graduated at the Bellevue Hospital Medical College in 1928 and has been identified with Loyola University since Sept. 1, 1943.

Personal.—Dr. Orlen J. Johnson, since August 1941 assistant secretary, Council on Industrial Health of the American Medical Association, has resigned to enter a residency in surgery at St. Luke's Hospital, effective September 30. Dr. Johnson, who graduated at the University of Michigan Medical School, Ann Arbor, in 1930, came to the American Medical Association from a position as plant physician of the Chrysler Corporation, Detroit.

MAINE

1945 Session of Maine Association.—The ninety-second annual session of the Maine Medical Association will be held at the Poland Spring House, Poland Spring, June 24-26, 1945.

MASSACHUSETTS

Women Eligible for Harvard Medical School.—On September 25 the board of overseers of Harvard College, Cambridge, approved a recommendation of the faculty of Harvard Medical School, Boston, that women students be hereafter eligible for admission. The recommendation had been previously approved by the Harvard Corporation and will become effective for students entering the school in the fall of 1945. The Harvard Medical School was opened in 1782. The average enrolment is slightly over 500 students.

MICHIGAN

Special Society Election.—Dr. Frank R. Menagh, Henry Ford Hospital, Detroit, is president of the Detroit Dermatological Society and Dr. Clarence E. Reyner, also of the Ford Hospital, is secretary-treasurer.

Personal.—Dr. Warren Bartlett Crane, Kalamazoo, has returned to private practice after almost three years in military service.—John F. Norton, Ph.D., was elected president of the Kalamazoo Tuberculosis Association August 17 to succeed Dr. Benjamin A. Shepard, who resigned because of ill health.—Dr. Earl F. Lutz, Detroit, has been promoted to associate medical consultant of General Motors. Dr. Lutz, who has served as chief plant physician at the Detroit Diesel Engine Division of General Motors since 1938, will work with Dr. Clarence D. Selby, Detroit, the corporation's medical consultant, and will direct his special attention to the medical aspects of the employment of war veterans.

MISSOURI

Personal.—Dr. Charles A. Brasher, assistant superintendent of the Missouri State Sanatorium at Mount Vernon, has been named superintendent, succeeding Dr. Jesse A. Stocker.—Dr. Lloyd L. Tate has been named health and hygiene director of the St. Louis public schools.

Medical Forum.—On September 20 the 1944-1945 Jackson County Health Forum opened its regular session with a talk by Dr. Arnold S. Jackson, Madison, Wis., on "Worry and Nervous Tension." Other speakers in the series will include:

Dr. Walter C. Alvarez, Rochester, Minn., What Makes Your Stomach Ache? October 18.

Dr. Karl A. Menninger, Topeka, Kan., Psychiatry In the War and After the War, November 15.

Dr. Elliott P. Joslin, Boston, New Discoveries and Management of Diabetes, January 17.

Dr. Alton Ochsner, New Orleans, Varicose Veins—Something Can Be Done About Them, February 21.

Lieut. Col. Philip Lewin, M. C., Backache, Injuries and Sprains, March 21.

Dr. Morris Fishbein, Editor of THE JOURNAL, Chicago, Infantile Paralysis, April 18.

NEW YORK

Medical Broadcasting.—The 1944-1945 broadcasting program of the Medical Society of the County of Monroe opened September 9 over the facilities of broadcasting station WHAM. This is the society's fourteenth season of broadcasting, and the opening broadcast was number 552 in the series. The society claims that its broadcast is among the oldest continuously produced medical broadcasts and is identified on the air as "Rochester's Medical Broadcast."

Changes in State Health Department.—Dr. Elizabeth M. Gardiner, Albany, director of the division of maternity, infancy and child hygiene, retired from state service effective August 31. Dr. Gardiner was director of the division of child welfare in the Rhode Island Department of Health from 1919 until 1923, when she joined the New York State Department of Health staff, serving first as associate director of the division of maternity, infancy and child hygiene and after 1926 as director. Jane E. Dale, Ph.D., has been appointed provisionally to the position of senior nutritionist in the state department of health, serving as supervising head of the nutrition bureau within the division of maternity, infancy and child hygiene.

New York City

The Gross Memorial Lecture.—Dr. Leo Loewe, New York, will deliver the seventh annual Louis Gross Memorial Lecture at the Jewish General Hospital, Montreal, October 25, on "Further Observations on the Combined Use of Penicillin and Heparin in the Treatment of Subacute Bacterial Endocarditis."

Meeting of Anesthetists.—The principal speaker at the meeting of the American Society of Anesthetists at the New York Academy of Medicine, October 12, will be Dr. Carl F.

Schmidt, professor of pharmacology, University of Pennsylvania School of Medicine, Philadelphia. Dr. Schmidt's subject will be "The Newer Concepts of Respiratory Control."

Hospital Flooded.—Three substreet floors of the Reconstruction Hospital were flooded September 10, causing damage estimated at \$100,000 to medical supplies and irreplaceable therapeutic equipment. The flood was caused by a break in the main shortly before midnight, September 9, but the valve controlling the flow of water was not located until sixteen hours later. The *New York Times* stated that at the height of the flood 40 feet of water inundated the three floors.

Course for Professional Workers.—"Child Health and the Classroom Teacher" is the theme of a course for teachers and professional workers which opened October 4 and will continue weekly until January 24. Dr. Michael Antell, health officer of the Washington Heights-Riverside Health District, is in charge of the course and the sessions are being held at the Washington Heights-Riverside Health Center of the city department of health. It is sponsored by the New York Tuberculosis and Health Association.

Louis Livingston Seaman Fund.—The New York Academy of Medicine announces the availability of the Louis Livingston Seaman Fund to further research in bacteriology and sanitary science. One thousand dollars is available for assignment in 1944. This fund has been made possible by the terms of the will of the late Dr. Louis Livingston Seaman and is administered by the committee of the academy. The fund will be expended only in grants in aid for investigation or scholarships for research in bacteriology or sanitary science and may be made for the securing of technical help, aid in publishing original work and the purchase of necessary books or apparatus. Applications will be received either from institutions or from individuals up to November 1. Communications should be addressed to Dr. Wilson G. Smillie, chairman of the fund, 1300 York Avenue, New York 21.

Mayor's Health Plan Incorporated.—Incorporation papers for the Health Insurance Plan of Greater New York (*THE JOURNAL*, May 13, p. 161), presented by Mayor Fiorello H. La Guardia, were filed August 31 with the state board of social welfare and the superintendent of insurance. If approved by these two agencies and by a justice of the state supreme court, the papers will establish a nonprofit membership corporation to pay insurance as the Health Insurance Plan of Greater New York. The papers will be filed with the secretary of state when the necessary approvals are obtained, and the plan will then be ready to function. The roster of incorporators includes many prominent names in medicine, it was stated, but does not include the names of representatives of five county medical societies. The United Medical Service, Inc., organized under the guidance of the medical profession and approved by the Medical Society of the State of New York, is circularizing physicians with a letter asking them to participate in this plan, which was also set up this year (*THE JOURNAL*, May 27, p. 296). In its letter to the physicians the United Medical Service reported that it would pay all bills on the basis of physicians' fees comparable with those in workmen's compensation schedules for subscribers whose incomes are "less than an amount to be determined by your board of directors and approved by the council of the Medical Society of the State of New York. When the subscribers' incomes exceed this amount, physicians will be privileged to make a further charge to their patients in addition to the fees which they will receive from the company." The mayor's tentative proposal has envisioned coverage "to every one who earns up to \$5,000 a year," it was stated.

OHIO

Dr. Markwith Ends Term as Health Commissioner.—Dr. Roll H. Markwith, Columbus, retired as director of the Ohio Department of Health on August 21, when his five year term expired, to become assistant medical director of the clinical laboratory owned and operated by Dr. Anson L. Brown, Columbus. Dr. Markwith had been health commissioner since January 1939, when a law enacted by the legislature in that year, reorganizing the state department of health and providing for a five year term for the director, became effective. In August 1939 Dr. Markwith was reappointed. Before becoming state health commissioner he had been health officer of Summit County. Until a new director is appointed by the governor, the department will be in charge of Mr.

James E. Bauman, LL.B., assistant director and chief of the legal division. In Ohio the law requires the governor to appoint a director of health from a list of five nominees submitted by the Ohio Public Health Council.

VIRGINIA

Dr. Porterfield Named Health Officer of Richmond.—Dr. Jack B. Porterfield has resigned as director of the bureau of industrial hygiene of the Virginia Department of Health, Richmond, to become director of the Richmond city health department, effective September 16. Dr. Porterfield graduated at University of Virginia Department of Medicine, Charlottesville, in 1933 and has been with the state department of health since 1939.

State Medical Meeting.—The ninety-sixth annual meeting of the Medical Society of Virginia will be held at the John Marshall Hotel, Richmond, October 23-25, under the presidency of Dr. Claude B. Bowyer, Stonega. Included among the speakers will be:

Drs. Frank S. Johns and James B. Stone, Richmond, Congenital Pyloric Stenosis with Series of Cases.

Dr. James Q. Gant Jr., Bethesda, Md., Dermatitis in the Munitions Industry.

Dr. Paul Hogg, Newport News, Erythroblastosis and the Rh Factor.

Dr. Alex F. Hartmann, St. Louis, Further Clinical Studies in Disturbances of Acid Base Balance.

Drs. Chas. H. Dawson, Suffolk, and Hubert D. Crow, Courtland, Report of Five Cases of Meningitis Treated Empirically with Sulfanilamide Under Rural and Low Economic Conditions.

Drs. Hugh P. Newbill and Randolph Leigh Jr., Richmond, Nonsurgical Therapy of Epilepsy.

Dr. Frederick E. Hamlin, Roanoke, An Investigation of Allergy in Routine Nose and Throat Practice.

Drs. George Cooper Jr. and Vincent W. Archer, University, Radiation and Neurosurgery in Advanced Painful Conditions.

Dr. Herbert C. ... Use in the ... Its

Dr. Wallace E. ... Penicillin.

Dr. Paul D. C. ... Heart Disease.

On Tuesday, October 24, clinics will be conducted under the auspices of the Medical College of Virginia. On Wednesday the Virginia Society of Chest Physicians will hold a luncheon meeting at Pine Camp. Various specialty societies plan luncheon sessions. The Woman's Auxiliary to the Medical Society of Virginia will hold its twenty-second annual meeting in Richmond at the John Marshall Hotel, October 23-24.

Special Examining Board in Basic Science Created.—Members of a three man special board of examiners in basic science, created by the 1944 general assembly to conduct examinations of applicants for licenses to practice the healing arts in Virginia, are Dr. Frank L. Apperly, professor of pathology, Medical College of Virginia, Richmond; Carl C. Speidel, Sc.D., professor of anatomy, University of Virginia Department of Medicine, Charlottesville, and Lucius J. Desha, Ph.D., professor of chemistry, Washington and Lee University, Lexington. The appointments were made by Governor Darden, according to the *Richmond Times-Dispatch*. The tenure of the board is five years. It was set up by the general assembly in the amendment to the healing arts statutes to permit the licensing of chiropractors and naturopaths in Virginia. The newspaper report stated that the purpose of the special board was to meet the objections that the state medical examining board, as now constituted, should not pass on the qualifications of chiropractors and naturopaths. The act specifies that the members of the special board shall be members of faculties of the accredited colleges of the state and shall not be medical practitioners. Examinations by the board will be limited to the basic sciences and shall include only the subjects of anatomy, bacteriology, elementary chemistry, pathology and physiology. The examinations are to be given in November of each year during the five year tenure of the board, with the first planned for November of this year. Under the act creating it the board may give examinations to all applicants for licenses to practice chiropractic or naturopathy who elect to take the special tests in basic science in preference to the more detailed examination in these subjects which is provided under the state board of medical examiners for applicants for licenses to practice medicine. A special provision in the act preserves the right of applicants in the military or naval service who, although otherwise eligible to take the special examinations, are prevented from doing so because of their absence from the state. Except for this exemption the special examinations are available only to those practitioners of chiropractic and naturopathy who were engaged in such practice for a period of one year prior to the effective date of the act, which was July 1. Applicants not in the armed services are required

to apply for the special examination prior to November 1 and to supply the board with satisfactory evidence of eligibility. The exempted servicemen may certify their eligibility at any time within six months after their discharge from the service.

WASHINGTON

Arthur Anderson Dies.—Mr. Arthur Anderson, executive secretary of the Washington State Medical Association for the past five years, died August 7 of coronary thrombosis, aged 47.

Stith Memorial Library.—The Dr. Robert M. Stith Memorial Association has been incorporated for the purpose of establishing a memorial library at Firland Sanatorium, Seattle. The nucleus will be the personal medical library of the late Dr. Stith, who was medical director of the sanatorium during the greater period of its existence, according to *Northwest Medicine*.

WEST VIRGINIA

Changes in Health Officers.—Dr. Ward L. Oliver, Point Pleasant, health officer for district number 3, has been transferred to Morgantown as health officer of Monongalia County. He succeeds Dr. William B. Bailey, who has been transferred to Norfolk, Va.

Dr. Angstadt Named Acting Director of Maternal and Child Hygiene Division.—Dr. Norman G. Angstadt, director of the bureau of county health work of the state department of health, has been appointed acting director of the division of maternal and child hygiene since the recent resignation of Dr. Lenore V. L. Patrick-Chipman (*THE JOURNAL*, June 24, p. 589).

Health Conference.—On October 16 the annual Northern District Health Conference will be held at the new West Virginia Training Center, Morgantown. Dr. James A. Dolce, Fairmont, director of the Marion County Health Department, will deliver the principal address, on "Public Health in the Schools." A feature of the conference will be the dedication of the training center.

New Clinics to Discover Cancer.—On August 31 Drs. Paul R. Gerhardt, director of the state division of cancer control, and J. Ross Hunter, Charleston, chairman of the cancer committee of the state medical association, conducted "case finding clinics" at Madison and Whitesville. The Boone County Medical Society cooperated in the clinics, arrangements for which were made by Dr. Robert L. Hunter, county health officer; nursing service was provided by the public health service and the Boone-Raleigh Clinic. Of 11 patients examined, 4 were found to have cancer. The clinics were conducted as an experiment. Regular tumor clinics have been established at the Laird Memorial Hospital, Montgomery; Mountain State Memorial Hospital, Charleston; St. Mary's Hospital, Huntington; Bluefield Sanitarium, Bluefield, and St. Mary's Hospital, Clarksburg. A tumor diagnostic clinic is now being organized in Morgantown under the auspices of the Monongalia County Medical Society, and the local medical societies are considering the establishment of similar clinics in Parkersburg and Fairmont. On September 15 64 active cases of cancer were under the care of the recently organized division of cancer control. Provision has been made for handling additional referrals without delay while applications for care through the new division are filed with the local departments of public assistance, and persons need not be receiving aid from this department to be eligible for cancer care. The department of public assistance furnishes information concerning the financial circumstances of the applicant, and the division determines whether the aid should be given. The possibility of developing additional channels through which applications may be made is now being given consideration with a view to speeding up the work of the division.

GENERAL

Call to Hunter College Graduates.—All women physicians who are graduates of Hunter College, New York, are asked to communicate with Ruth Lewinson, 18 East 41st Street, New York 17, president of the Associate Alumnae of Hunter College. The college is making preparations to observe its seventy-fifth anniversary and wishes to reach as many of its graduates as possible.

Funds for Infantile Paralysis During Epidemic.—The National Foundation for Infantile Paralysis on September 3 announced that, up to September 1, \$397,639 had been sent to twelve states to assist in defraying expenses incidental to the

prevailing epidemic of poliomyelitis. Of the total, North Carolina has received \$230,974. A total of \$51,311 has been sent to aid foundation chapters in New York State whose funds have been depleted in aiding victims, and another \$50,000 has been sent for a similar purpose to Kentucky. Other states which have received financial aid are Virginia, Ohio, Florida, Illinois, Iowa, Kansas, Mississippi, California and Oregon. In other states 50 per cent of funds retained by the foundation's chapters from the March of Dimes has been sufficient to provide proper medical care for all victims regardless of age, race, creed or color. Specially trained physicians were sent into North Carolina, Kentucky and New York, and thirty-five physical therapists were dispatched to fill the needs in fourteen states. A total of 6 tons of wool for hot packs has been shipped into thirteen states and the District of Columbia.

Association of Medical Colleges.—The fifty-fifth annual meeting of the Association of American Medical Colleges will be held at the Hotel Statler, Detroit, October 23-25, under the presidency of Dr. Ewen M. MacEwen, Iowa City. Among the speakers will be:

Drs. George S. Eadie and Wilbur C. Davison, Durham, N. C., Post-war Medical Education.
Dr. C. Sidney Burwell, Boston, Graduate Medical Education in the Postwar Period.
Drs. Donald B. Tresidder, Stanford University, and Winston-Salem, N. C., J. Gardner, Chicago, Deceleration of the
Dr. Gordon B. Myers, Detroit, The Te
Drs. Loren R. Chandler, San Francisco
Charles D. Creevy, Minneapolis, Requirement of Internship for Graduation.
Drs. Joseph Turner, New York, and Leverett S. Woodworth, Detroit, The Internship: When to Contact Students: Time of Appointment.
Dr. Daniel E. Hasley, Detroit, The Teaching of Parasitology and Tropical Medicine.
Dr. William Dock, New York, Mixed Task Forces in Medical Education.
Drs. James A. Greene, Houston, George T. Harrell Jr. and Herbert M. Vann, Winston-Salem, Integration of the Curriculum: Overdepartmentalization.
Charles I. Reed, Ph.D., Chicago, A Study and Analysis of Faculty and Student Opinions of Training in Preparation for the Study of Medicine.

Young Mothers and Rapid Wartime Increase in Birth Rate.—Young mothers between the ages of 20 and 30 having their first child were the principal contributors to the rapid wartime rise in the American birth rate, according to the statisticians of the Metropolitan Life Insurance Company. The chief factor in the rise at the younger ages has undoubtedly been the recent upswing in the marriage rate. A good part of the increase, however, is accounted for by women who had been married for some time but delayed having children until economic conditions became more favorable. Although the general birth rate has increased with unequaled rapidity during the war period, the trend toward small American families as well is still in evidence. Families with five or more children have continued their long term prewar downward trend. Similarly the general trends of reproductivity in relation to the age of the mother have continued essentially along the lines prevailing just prior to the beginning of the war but in more accentuated form, it was stated. It was pointed out that from 1933, when the birth rate in this country reached its lowest point, to 1939, the increase in births was almost entirely concentrated among women under 30. Likewise between 1939 and 1942 white women at ages 20 to 24 "recorded the largest increase in the birth rate, 29 per cent; at ages 25 to 29 the rise was 26 per cent." The rate among women in their early thirties increased by 17 per cent during the war years since 1939, but in the group at the age of 40 or over the birth rate decreased between 1939 and 1942. First births showed a considerably larger wartime increase than any of the later orders of birth. The largest rise occurred among women in their twenties, among whom it amounted to 40 per cent; among women in their thirties the gain was 33 per cent. Families having their second or third child also showed considerable gains during the war period, while the data also indicate a small increase between 1939 and 1942 in the birth rate of fourth children. For children of fifth and higher orders of birth the long term prewar downward trend has persisted, giving every indication that the tendency toward small American families will continue, it was stated.

International Medical Assembly.—The Inter-State Postgraduate Medical Association of North America will hold its twenty-ninth annual International Medical Assembly at the Palmer House, Chicago, October 17-20. Among the speakers will be:

Dr. Bert I. Beverly, Chicago, Spoiled Children.
Dr. James L. Poppen, Boston, Intracranial Aneurysms: Diagnosis and Management.
Dr. Frank H. Krusen, Rochester, Minn., The Abuse of Rest as a Therapeutic Agent.
Dr. W. James Gardner, Cleveland Heights, Ohio, Subdural Hematoma.
Dr. Charles G. Johnston, Detroit, Intestinal Obstruction.

Dr. Harry L. Alexander, St. Louis, Primary Atypical Pneumonia.
Dr. Elliott P. Joslin, Boston, Diabetes Today.
Dr. J. Arnold Barger, Rochester, Management of Ulcerative Colitis.
Major. Gen. David N. W. Grant, the Air Surgeon, Five Wartime Achievements of the Army Air Forces Medical Services.
Dr. Karl A. Menninger, Topeka, Kan., Diagnosis and Treatment of Schizophrenia.
Dr. Frederick A. Davis, Madison, Wis., What the General Practitioner Should Know About Ophthalmoscopic Examinations (the Schneider Foundation eye presentation).
Lieut. Col. Donald McEachern, R. C. A. M. C., Diagnosis and Treatment of Epilepsy.
Dr. Edward J. Stieglitz, Washington, D. C., Geriatrics in Wartime.
Dr. Donald C. Balfour, Rochester, Diagnosis and Treatment of Duodenal Ulcer.
Dr. Julian Deryl Hart, Durham, N. C., Air Borne Infections in Clean Operative Wounds.
Dr. Robert S. Berghoff, Chicago, The Senile Heart.
Brig. Gen. Fred W. Rankin, M. C., Comments on Surgical Methods Used in World War II.
Dr. Edward Weiss, Philadelphia, Psychosomatic Aspects of Problem Cases in the Practice of Medicine.
Dr. Richard B. Cattell, Boston, Colectomy for Ulcerative Colitis.
Col. Byrl R. Kirklm, M. C., Some Common Errors in X-Ray Interpretation.
Dr. Arthur Steindler, Iowa City, Disabilities Resulting from Compression Fractures of the Spine.
Dr. John W. Harris, Madison, The Use and Abuse of Forceps.
Norman T. Kirk, Surgeon General of the Army, Surgical Care of the Battle Casualty.
Dr. Oscar T. Clagett, Rochester, Surgical Treatment of Bronchiectasis.
Dr. Adie R. Barnes, Rochester, Diagnosis and Treatment of Coronary Sclerosis.
Dr. Frank S. Dolley, Los Angeles, Chest Injuries.

In addition to these presentations, a number of diagnostic clinics will be conducted. At the assembly dinner Dr. Josiah J. Moore, Chicago, Treasurer of the American Medical Association, will, as general chairman of the assembly, give the welcoming address and introduce General Rankin, president of the association, who will speak on "Medical Activities in the Normandy Beachhead Landing." Other speakers will include Dr. Walter H. Judd, congressman from Minnesota, on "Our Prospects for the War and the Peace."

LATIN AMERICA

Health Activities in Latin America.—Traveling Health Requirements in Canal Zone.—On September 14 the Panama Canal Health Department issued a statement outlining vaccination and health requirements for traveling in the Canal Zone, emphasizing the need of a smallpox vaccination and freedom from contagious diseases. The quarantine division requires that every one coming into the Canal Zone present a certificate showing that successful vaccination has been performed within the preceding five years. If one does not have a certificate he must be vaccinated by a quarantine physician before he is allowed to enter the zone. The U. S. Foreign Quarantine requires that every person entering the United States must present a smallpox vaccination certificate. If a traveler does not possess one, quarantine officials insist that he be vaccinated before he is permitted to enter the United States. Because most Central and South American countries require smallpox vaccination certificates of incoming travelers, the consuls of these countries will not issue visas permitting entry unless shown a certificate. In 1940 the health department carried out a zonewide smallpox vaccination campaign. Copies of certificates based on this campaign may be obtained from the chief health officer. Record of preemployment vaccination is included in the personnel files of many Canal Zone employees who have come to the Zone during the past two years. Copies based on these records may be obtained from the chief health officer, as may copies based on records sent in the past to the chief health officer from the outpatient clinics of Panama Canal hospitals. The school physician has on file the records of vaccinations he has done on school children, and the district physicians have the records of vaccinations done in their dispensaries. Copies may be obtained from either of these sources. Many Central and South American countries also require a statement signed by a recognized physician certifying that the incoming traveler has been examined and found free of contagious disease. Since these countries will turn back travelers unless they have this statement, the Canal Zone Quarantine will not let a person leave the Zone without such statement if he plans to visit in one of them. For direct travel to the United States or for return to the Zone from the states or from these countries, this statement is not necessary. Statements certifying health may be obtained from any district physician, from the medical clinic of any Panama Canal hospital or from the chief health officer. Each person for whom such a certificate is issued must appear personally before the physician who is to sign the certificate. No other vaccination or health requirements must be met in order for Panama Canal employees or their families to travel.

Typhoid-paratyphoid inoculations are recommended for every one, and especially for travel in Central or South America, but are not required. Typhus vaccination is recommended for travel in certain Central and South American countries but is not required. Should there be epidemics or great health risks in these countries in the future, further recommendations will be made by the chief health officer.

Personal.—Dr. Carlos Estevez, formerly director general of sanitation of Guatemala, has joined the Pan American Sanitary Bureau, with headquarters in Mexico, for the study of filariasis.

Penicillin in San Juan.—Twenty million units of penicillin has been given to the San Juan Health Department for use in its campaign against gonorrhea.

Government Services

Name Aides on Rehabilitation

Brig. Gen. Frank T. Hines, Veterans Administrator, Washington, D. C., announced September 3 the appointment of four educators. The names of the appointees are Robert G. Sproul, LL.D., president of the University of California, Berkeley; Rufus C. Harris, LL.D., president of Tulane University, New Orleans; Robert B. Stewart, LL.D., controller of Purdue University, West Lafayette, Ind., and Horace S. Ford, bursar of the Massachusetts Institute of Technology, Cambridge, Mass.

Dr. Doyle Appointed to Industrial Hygiene Division

Dr. Walter E. Doyle, in charge of the bureau of industrial hygiene, Kentucky State Department of Health, Louisville, has been appointed chief of the medical unit, industrial hygiene division, Bureau of State Services, U. S. Public Health Service. Dr. Doyle's appointment was effective October 1. He graduated at the University of Buffalo School of Medicine, N. Y., in 1921.

Funds for School and Child Care Allocated

Federal contributions amounting to \$713,707 to help twenty-three communities meet operating costs of school, child care and recreation facilities were announced September 12. Thirteen of the communities were given a total of \$554,337 to help maintain school facilities for the year ending June 1945. The Roane County Board of Education at Kingston, Tenn., was allotted \$219,131 and five communities in Oklahoma were awarded contributions totaling \$227,007, with Tulsa receiving \$171,868. Child care programs in Lackawanna and Kenmore, N. Y., near Buffalo, Ecorse, Mich., in the Detroit area, and Fort Belvoir, Virginia, were among the projects assisted.

Funds for Public Works

The President has approved sixty-two new Federal Works Agency projects for financial assistance to war impacted communities to provide hospital, school, recreation and child care facilities. Federal funds allotted total \$2,017,050. Fifteen of the projects are for war public works construction. Federal allotments totaling \$945,943 were made for this construction. The total cost of the work is estimated at \$1,242,349. The applicants are to furnish \$296,406. The remaining forty-seven projects represent federal contributions to help defray operation and maintenance costs of hospitals, both general and venereal disease control, public schools, facilities for the care of children of mothers employed in essential work, and recreation programs. The federal contributions for these service projects aggregate \$1,071,107. Baltimore was allowed \$30,850 to assist in the operation of venereal disease hospital facilities. An allotment of \$563,500 to the St. Monica's Hospital and Health Center at Phoenix, Ariz., was increased to \$648,500 to expand the project to include a 40 bed contagious disease ward together with a 130 bed hospital building, 30 beds to be reserved for venereal disease patients, and a 78 bed nurses' home.

CORRECTION

Error in Location.—The location of Dr. Bertalan Hoch, whose obituary was reported in THE JOURNAL, September 16, page 187, should have been New York and not Jersey City, N. J.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept 2, 1944.

Trial of the Russian Serum for Rheumatism with Unsatisfactory Results

The Empire Rheumatism Council reports that tests with the scanty supply of the A C B serum of Professor Bogomoletz from Russia have not given favorable results. The best that can be said is "not proven." Nevertheless, in view of the high reputation of Soviet medical research, it is possible that, with a more detailed statement of the best methods of use and some lead as to the type of rheumatic disease to which the serum is best adapted, it may be found that the claim advanced can be substantiated. As soon as war conditions allow the Empire Rheumatism Council proposes either to invite a representative of Professor Bogomoletz to visit England or to send a research scientist to Russia to make further investigations.

Death of Sir Arthur Hurst

Sir Arthur Hurst, the great clinician, has died suddenly at the age of 65 from an attack of asthma, a disease from which he was a lifelong sufferer, and British medicine has lost a most original mind. Much of his work was performed despite a continuous state of asthma. At Guy's Hospital he would arrive at 2 o'clock and give himself an injection of epinephrine, break away from his ward round at 3 for another injection and finally have one at 4 before leaving for home, white and tired but indomitable. He was educated at Oxford, where he took a first in the final honors school of physiology. He then went to the medical school of Guy's Hospital, where he had a distinguished career. After qualifying he studied in Munich, Paris and America. At the early age of 27 he was appointed assistant physician to Guy's Hospital with charge of the neurologic department. As a physiologist he had studied at Harvard the work of Cannon on the use of the opaque meal to record the shape of the stomach in casts and he had seen something of the kind attempted on the human stomach in Germany. At Guy's he was a pioneer in the study of the movements of the alimentary canal and the mechanism of pain. He was the first to distinguish two types of constipation—colonic, in which passage through the colon is delayed and dyschezia (difficult defecation, a word coined for him). In dyschezia the feces reach the rectum in normal time but their evacuation is delayed by insufficient defecation. Neglect to respond to the call to defecation may end in loss of the conditioned reflex in which the rectum contracts and the anal sphincter relaxes. The rectum is found packed with feces at whatever hour it is examined. The patient takes aperients to produce fluid feces which require no effort for evacuation. This work is regarded as a noteworthy contribution to the understanding and treatment of constipation.

His thorough and extensive investigations made him the leading authority on diseases of the esophagus, stomach and intestine. He wrote on these subjects in the textbooks, where he combined knowledge of the latest views on physiology and pathology with minute and original clinical observation. His work on achalasia of the cardia, gastritis, peptic ulcer and ulcerative colitis marked a great advance. He lived to see his views on the medical treatment of gastric ulcer generally accepted. He was a trenchant critic of current errors and debunked many mythical maladies, such as "mucous colitis." He pointed out that the presence of mucus with solid feces was a normal event and that it was a gross error to regard it as evidence of disease. He denounced the "colon laundries" which have become popular in recent years in this country. The colonic douche was an unnatural irritant, and the mucus which

came away with the last 20 or 30 pints often administered was not the accumulation of months, as the patient was assured, but a protective reaction against the irritation of the douche. Other mythical maladies exposed by him were movable kidney, gas troptosis and abdominal adhesions. He pointed out that when appendectomy failed to cure chronic pain in the right iliac fossa a second error was made and adhesions were diagnosed. But the majority of abdominal adhesions were harmless. Another mythical malady was intestinal intoxication due to intestinal stasis.

It was characteristic of his work that it always seemed to touch fundamentals and have a message for the general man or the expert in quite another branch of medicine. Thus he not long ago held the rapt attention of the Section of Proctology of the Royal Society of Medicine when he discoursed on Functional Diseases of the Colon and Rectum. His teaching that the so-called pernicious vomiting of pregnancy is hysterical has been adopted by leading obstetricians (*THE JOURNAL*, May 20, p. 223). Though a kindly man, his zeal for what he conceived to be the truth sometimes made his criticisms at medical meetings devastating.

In spite of his frail health his literary output was large. Some of his numerous articles in medical journals were collected in a book entitled "Essays and Addresses on Digestion and Nervous Disorders." His book "Constipation and Allied Disorders" (second edition, 1919) was translated into French (1912). "Medical Diseases of the War" was published in 1918 and the third edition appeared in 1942. Other books were "The Constitutional Factor in Disease" (1927) and "Functional Disorders" (1920). With a surgeon, M. J. Stewart, he cooperated in writing "Gastric and Duodenal Ulcer" (1929). He enjoyed an international reputation, as was shown by his presidency of the International Society of Gastro-Enterology and an honorary membership in the American Medical Association, the American and Mexican Gastro-Enterological associations, the Belgian Gastro-Enterological and the French Gastro-Enterological Association. From 1927 to 1929 he was president of the Section of Medicine of the Royal Society of Medicine.

Research on Pneumoconiosis

Though it has long been known that dust was injurious to the miners' health, only in 1918, twenty-one years after the first workmen's compensation act was passed, was silicosis made a "scheduled" disease for compensation, and only in 1934 was the plan extended to include any operation underground in any coal mine. Not until 1943 was it officially recognized that miners, especially in certain parts of the Welsh coal field, might contract disease of the lungs which was not due only to dust containing silica. In February of last year an act was passed to bring into the scope of workmen's compensation all cases of pneumoconiosis. The way for this legislation was prepared by six years of scientific investigation in the pits of South Wales by a special committee of the Medical Research Council. Its reports resulted in an order compelling the adoption in any mine in South Wales or Monmouthshire of a variety of measures to reduce exposure of the man to dust and the appointment by the minister of fuel and power of an advisory committee on the treatment and rehabilitation of Welsh miners suffering from pneumoconiosis.

Already measures are being taken to suppress harmful dusts at working places in mines but the committee considers that further attention is needed to the treatment of affected persons and their restoration to health. Present legislation is insufficient to enable the committee to advise the introduction of large scale measures, further research into the cause, progress and treatment of the disease is felt to be necessary. Accordingly, the establishment of a research unit with accommodations for about 30 patients is recommended. The unit is to be linked, through a central authority, with the pro-

ceeding on other phases of the problem; it is planned to acquire more precise knowledge of the causes and diagnosis of the disease, to develop and apply better methods of suppressing dangerous dust and to resettle and retrain disabled miners to take up more suitable employment. The committee also recommends initial and periodic clinical and x-ray examination of miners. Correlation of the findings with the results of pathologic research into early changes in the lung condition, the progression of those changes and the part played by tuberculosis and other infections will also be studied.

Radical Reforms of Medical Education

In spite of the war, reforms which embrace every aspect of social security are being worked out. As the proposed National Health Service will depend largely on the work of physicians, the government appointed a committee to inquire into the organization of medical schools, particularly as to clinical teaching and organization for research. The result of an exhaustive inquiry is an elaborate report recommending many radical reforms: (1) financial assistance to medical students so that children of ability are not deterred from entering the medical profession; (2) coeducation and filling of all hospital appointments by open competition without any sex bar; (3) whole time professors of medicine, surgery and obstetrics and gynecology in every school; (4) more emphasis on measures that make and preserve a healthy nation; (5) in clinical instruction, more emphasis on fundamental principles rather than on imparting a mass of factual knowledge; (6) after a student has passed the final examination, a junior appointment in a recognized hospital for twelve months before admission to the medical register; (7) postgraduate study a regular feature of general practice.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, Aug. 25, 1944.

Vital Statistics of Rio de Janeiro for the First Half of 1944

Provisional data of vital statistics for the city of Rio de Janeiro for the first half of the present year are now available. During this period (mostly summer and autumn in the Southern Hemisphere) the total number of deaths from all causes was 16,989, corresponding to the crude annual death rate of 17.63 per thousand, as the city population computed for July 1 was 1,927,000. From the mean annual death rate of 26.00 per thousand of population for the five year period 1899-1903 this rate has declined to 23.55 for 1909-1913, to 21.95 for 1919-1923 and finally to 16.73 for 1929-1933. During this whole period yellow fever, plague and smallpox have been eradicated and malaria substantially reduced under the leadership of Dr. Oswaldo Cruz and afterward of Dr. Carlos Chagas, thus ending the first phase of the public health work in the capital city of the country. Now a second phase has been opened, the main features of which should be the conquest of tuberculosis, syphilis, typhoid, dysentery, diphtheria and measles and the lowering of infant mortality, the latter mostly of a nutritional and digestive origin. The success of the whole campaign is still waiting for the use of the modern weapons of public health work, especially in adequate intensity and quantity, or with the indispensable continuity. The number of live births registered during the period was 2,865, corresponding to an annual birth rate of 22.69.

The leading cause of death was tuberculosis, with a total of 2,977 deaths in the six months, which would correspond to an annual death rate of 309 per hundred thousand of population (325 in 1943, 312 in 1942 and 316 in 1941). The rest of the "infectious and parasitic diseases" has caused 2,096 deaths in the period, which, together with those from tuberculosis, makes a total of 5,073 deaths (29.86 per cent of the

deaths from all causes), or an annual death rate of 527 per hundred thousand of population as against about 95 per hundred thousand for the aggregate of the largest cities of the United States.

Cancer, which has caused 709 deaths, or 73.59 per hundred thousand (72.06 in 1943, 67.34 in 1942 and 66.44 in 1941) has been on a continuous increase as a cause of death since 1903-1907, when the mean annual death rate was 34.75. The second most important single group of causes of death is that of the diseases of the digestive system, represented by 2,690 deaths in the period covered, which would correspond to the annual death rate of 279 per hundred thousand. Diseases of the circulatory system accounted for 2,678 deaths, or the annual death rate of 278 per hundred thousand.

The diseases of the nervous system have caused 651 deaths, or the annual death rate of 67.57 per hundred thousand (65.40 in 1943, 65.94 in 1942 and 71.17 in 1941), the largest contribution being from "intracranial lesions of vascular origin," 461 deaths, or the annual death rate of 47.85 per hundred thousand. Violent deaths were 562, which would correspond to 58.33 per hundred thousand (56.67 in 1943, 65.51 in 1942 and 66.46 in 1941).

Retirement of Professor Austregesilo

Dr. Antonio Austregesilo, one of the leading figures of modern medicine in Brazil, has reached the retirement age after thirty-five years of active duty as professor at the University of Rio de Janeiro. He was the brightest pupil in the school of psychiatrists founded in Brazil by Dr. Julianio Moreira. Beginning as a psychiatrist in a small ward at the modest Praia Vermelha Hospital for the Insane, Dr. Austregesilo shifted little by little to neurology, which was then nonexistent in Brazil and which he established in the country as a new branch of clinical medicine. Thereafter he became a professor of neurology, teaching every morning in the famous twentieth ward of the old Santa Casa Hospital, where this specialty was taught in connection with the university. He made several trips to Europe, where he met the leading neurologists of London, Paris, Berlin and Vienna, as well as to Buenos Aires, where he was rated as the greatest neurologist of Latin America. In recent years the teaching of Professor Austregesilo was centered at the Institute of Neurology, a department of the old Psychiatric Hospital of Praia Vermelha. He has written many papers and monographs and several books, all dealing with neurology, and among his pupils are Mauricio França, Espozel, Teixeira Mendes, Studart, Galotti, Deolindo Couto, Aloysio Marques and Borges Fortes.

Brief Items

Two wards of the Gaffrée-Guinle Foundation Hospital of Rio de Janeiro have recently been set aside for the rapid treatment of syphilis. This is the first hospital service fully equipped in Brazil for this kind of work, and the foundation has decided to develop the service as the need requires.

The Sanitation Division of the Health Department of the state of Rio Grande do Sul has completed an extensive plan to provide water supply services and sewerage systems for several small cities of the state. An important sum has been appropriated to enable the state administration to cooperate with those small cities in the execution of the plan.

Marriages

JOHN SINCLAIR CAMPBELL, Manistee, Mich., to Miss Martha Anderton of Birmingham, Ala., in Evanston, Ill., August 12.

BEN THOMAS GALBRAITH, Henderson, Tenn., to Miss Mai Catherine Herron of Trenton, August 15.

ROBERT B. COFIELD, Cincinnati, to Miss Clara Hofferberth of Dayton, Ohio, recently.

Deaths

Frederick Clark Holden * New York; University of the City of New York Medical Department, New York, 1892; professor emeritus of obstetrics and gynecology at the New York University College of Medicine; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member and past president of the American Gynecological Society; member of the American Society for the Control of Cancer; fellow of the American College of Surgeons; obstetrician and gynecologist, *French Hospital*; consulting gynecologist, *Harlem Hospital* and the *Bronx Maternity and Woman's Hospital*; director of gynecology, *Jersey City Medical Center*, Jersey City, N. J.; consulting obstetrician, *Methodist Hospital*, Brooklyn, Mount Vernon Hospital, Mount Vernon, N. Y., and the *Margaret Hague Maternity Hospital*, Jersey City, N. J.; consulting obstetrician and gynecologist at the *Bellevue Hospital*, where he had been director of the gynecologic service for many years; in 1941 received the doctorate of public health from New York University; died in *Prouts Neck, Maine*, August 27, aged 75, of acute pulmonary edema.

Eben Homer Ben-net * Lubec, Maine; *Jefferson Medical College of Philadelphia*, 1875; an Affiliate Fellow of and in 1912-1913 delegate to the American Medical Association; past president of the Maine Medical Association and the Washington County Medical Society; acting assistant surgeon in the U. S. Public Health Service; school superintendent for fifty years; in 1894 one of the first public high schools to be established in Maine was opened in Lubec largely through his interest in public education; for many years physician to the Roosevelt family when it summered in *Campobello*, officiating at the birth of *Franklin Jr.* in 1914 and assisting with *Franklin Sr.* when he first became ill with poliomyelitis; in 1935, at the suggestion of Mrs. Roosevelt, awarded the golden emblem of the *Beacon Circle of Honor*, an honor paid by the *Beacon School, Boston*, to an individual "who is an outstanding example for youth"; in 1937 received the annual award of the *Maine Medical Association* for "outstanding service as a doctor"; died August 31, aged 96, of cerebral thrombosis.

Edwin Manson Neher * Laguna Beach, Calif.; *Rush Medical College, Chicago*, 1906; member of the House of Delegates of the American Medical Association in 1922, 1924,

1926 and 1928; member, past president and vice president of the *Utah State Medical Association*; member and past president of the *Western Ophthalmological Society*; member of the *American Academy of Ophthalmology and Otolaryngology*, *Pacific Coast Oto-Ophthalmological Society* and the *American Ophthalmological Society*; fellow of the *American College of Surgeons*; specialist certified by the American Board of Ophthalmology; formerly ophthalmologist on the staff of *St. Mark's Hospital, Salt Lake City*, where he was also ophthalmologist for the *Utah Fuel Company*; died July 8, aged 69, of cerebral hemorrhage.

Thomas Harris Cherry * New York; *Columbia University College of Physicians and Surgeons, New York*, 1904; specialist certified by the American Board of Obstetrics and Gynecology, Inc., clinical professor of gynecology at the *New York Post-Graduate Medical School, Columbia University*; fellow of the American College of Surgeons and the New York Academy of Medicine; attending gynecologist at the *New York Post-Graduate Hospital*; consulting gynecologist, *Suffolk County Sanatorium, Holtsville*, *Flushing Hospital and Dispensary, Flushing*, and the *All Souls Hospital, Morristown, N. J.*; author of "*Surgical and Medical Gynecologic Technic*"; died in the *Manhattan General Hospital* August 30, aged 64, of coronary thrombosis.

Katherine Pritchard Hoyt, *Wenham, Mass.*; *Woman's Medical College of the New York Infirmary for Women and Children, New York*, 1887; died June 1, aged 79, of coronary thrombosis.

Charles Calvin Hubbard, *Farmer, N. C.*; *Jefferson Medical College of Philadelphia*, 1888; honorary member of the Medical Society of the State of North Carolina; member of the *Randolph County Board of Health*; died July 20, aged 76, of angina pectoris.

William Merritt Jones, *Greensboro, N. C.*; *University of Maryland School of Medicine, Baltimore*,

1903; honorary member of the Medical Society of the State of North Carolina; formerly a member of the state board of medical examiners; served as health officer of *Guilford County*; examining physician for the county draft board during World War I and II; medical director of the *Jefferson Standard Life Insurance Company*; died July 29, aged 63, of carcinoma of the lung.

Benjamin Baker Kelly, *Purdy, Mo.*; *University of Tennessee Medical Department, Nashville*, 1890; served during World War I; served as president of the school board; died



LIEUT. WALTER E. BROWN
(MC), U.S.N., 1913-1943



LIEUT. GILBERT C. CAMPBELL
(MC), U.S.N., 1914-1943

KILLED IN ACTION

Walter Earl Brown * Lieutenant (MC), U. S. Navy, *Wilson, N. C.*; *Duke University School of Medicine, Durham*, 1938; served an internship at the *Park View Hospital, Rocky Mount*, and the *Baker Sanatorium in Lumberton*; commissioned a lieutenant (jg) in the medical corps of the United States Navy on Oct. 2, 1940 and later promoted to lieutenant; aged 30; was killed in action in the Pacific area; the presumptive date of death was Nov. 14, 1943, according to the Navy Department.

Gilbert Carmon Campbell * Lieutenant (MC), U. S. Navy, *McCracken, Kan.*; *Creighton University School of Medicine, Omaha*, 1940; served an internship at the *Creighton Memorial St. Joseph's Hospital, Omaha*; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on July 7, 1941; became a lieutenant (jg) in the medical corps of the regular U. S. Navy on March 26, 1942; promoted to lieutenant on June 15, 1942; aged 29; killed in action in the Pacific area; presumptive date of death Nov. 16, 1943, according to the Navy Department.

in the Barry County Hospital, Cassville, July 13, aged 74, of uremia and chronic myocarditis.

Pierre Ulric Laberge, Ambrose, N. D.; School of Medicine and Surgery of Montreal, Que., Canada, 1886; died July 4, aged 83, of cerebral hemorrhage.

Eldorus De Motte Lyon, Hastings-on-Hudson, N. Y.; University of the City of New York Medical Department, New York, 1877; formerly health officer of the village of Peekskill and the town of Cortland; at one time on the staff of the Peekskill Hospital, Peekskill; died August 11, aged 88.

Will Hale Malone, Atlanta, Ga.; Atlanta College of Physicians and Surgeons, 1912; served during World War I; for many years on the staff of the Veterans Administration Facility, where he died July 9, aged 53, of cerebral hemorrhage.

Harry Knox Mansfield, Philadelphia; Hahnemann Medical College and Hospital, Philadelphia, 1885; served on the staffs of the Hahnemann and St. Luke's hospitals; died in Philadelphia General Hospital July 22, aged 82, of hypertensive cardiovascular disease.

William Clawson Martin @ Detroit; Detroit College of Medicine, 1890; an Affiliate Fellow of the American Medical Association; member of the American Urological Association;

Fred Ephraim Miller, Grand Rapids, Mich.; Chicago College of Medicine and Surgery, 1910; served during World War I; formerly a member of the medical staff of the city public schools; served as medical examiner for the state boxing commission and had been on the Michigan committee for the 1932 Olympiad; at one time connected with the police department and the contagious disease bureau of the Chicago department of health; died in the Veterans Administration Facility, Hines, Ill., July 30, aged 56, of chronic pulmonary tuberculosis.

Marc Monroe Mouton, Lafayette, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1913; served during World War I; formerly lieutenant governor of Louisiana, coroner of the Lafayette Parish and health officer of the city of Lafayette; on the visiting staffs of the Lafayette Charity Hospital and the Lafayette Sanitarium; died August 21, aged 53, of pulmonary tuberculosis.

Willis Bent Morse @ Salem, Ore.; Willamette University Medical Department, Salem, 1891. fellow of the American College of Surgeons; for many years a member and at one time president of the state board of health; past president of the Oregon State Medical Society; chairman of the state medical advisory board during World War I; visiting surgeon, Salem



CAPT. JOHN P. KFEFT
M. C., A. U. S., 1916-1944



MAJOR LUCIUS G. McLAUGHLIN
M. C., A. U. S., 1898-1944



CAPT. THOMAS J. ROBBINS
M. C., A. U. S., 1917-1944

emeritus professor of urology at his alma mater; formerly on the staff of the Children's Free Hospital; died in the Henry Ford Hospital August 21, aged 75, of carcinoma of the esophagus and hemorrhage.

Arnold B. McCarty, Owensboro, Ky.; Louisville Medical College, 1900; died in the Owensboro-Daviess County Hospital July 27, aged 67, of heart disease.

Deaconess Hospital and the Salem General Hospital, where he died July 20, aged 78, of cerebrovascular accident.

George Earl Paullus Sr. @ Memphis, Tenn.; Barnes Medical College, St. Louis, 1908; served during World War I; on the staff of St. Joseph's Hospital, where he died July 29, aged 62, of chronic cholecystitis, acute pancreatitis, acute hepatitis and rupture of the retroperitoneal artery.

KILLED IN ACTION

John Patrick Keefe, Detroit; Wayne University College of Medicine, Detroit, 1943; served an internship at the City of Detroit Receiving Hospital; commissioned a first lieutenant in the medical corps, Army of the United States, July 28, 1942; began active duty on July 15, 1943, attached to the 137th Ordnance Maintenance Battalion, Armored Division, Camp Chaffee, Ark.; later promoted to captain; died in France June 24, aged 28, as the result of wounds received in action on D day, June 6.

Lucius Gould McLaughlin @ Ashland, Pa.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1924; served an internship at the Montreal General Hospital, Montreal, Que., Canada, and the Ashland State Hospital, where he was a resident physician and a mem-

ber of the board of governors; served in France during World War I; compensation surgeon for the Philadelphia and Reading Coal and Iron Company; commissioned a captain in the medical corps, Army of the United States, on Oct. 21, 1942; later promoted to major; died in the European area June 20, aged 45, of wounds received in action.

Thomas James Robbins, Heber Springs, Ark.; University of Arkansas School of Medicine, Little Rock, 1941; commissioned a first lieutenant in the medical corps, Army of the United States, on May 11, 1942; began active duty on July 1, 1942; later promoted to captain; died in the European area June 23, aged 26, of wounds received in action.

Bureau of Investigation

"GILJAN" TESTIMONIAL OUTLIVES WRITER

"Wonderful Medicine" Fails to Save Him

On one page of the Cleveland News for July 20, 1944 appeared the testimonial of Alexander Kellough for "Giljan," reproduced here (reduced), and his death notice.

In his testimonial Mr. Kellough said, in part, "Giljan is a wonderful medicine. Any person having trouble such as mine

BACKACHE TORTURED HIM; WEAK FROM LOSS OF SLEEP

Mr. Alexander Kellough of 2508 F. Morris Block Place, Cleveland, Was Also in Misery From Indigestion, Gas Pains—Recommends Giljan as "Wonderful Medicine."



Mr. Alexander Kellough

Mr. Kellough's statement should bring comfort to thousands of suffering men and women who have sought in vain for relief from the same torturing miseries which plagued this Cleveland man. His testimony explains the amazement even of druggists, at the wonderful relief which Giljan is giving to so many who have agonized for years from stomach, liver, kidney ailments, bodily aches and pains. Mr. Kellough says:

"Constipation Slowed Me Up"

"I had backache and back weakness so bad that often it was hard to get out of bed mornings. I lost much sleep. My stomach was sour, too, and gas pains were so terrible I didn't care to eat. Constipation slowed me up, too, and kept me miserable. I have now taken almost 3 bottles of Giljan and feel

greatly improved. Back pains have disappeared and I sleep and eat much better. Giljan is a wonderful medicine. Any person having trouble such as mine should lose no time in taking it."

Made From Nature's Herbs

Giljan is an advanced medical compound containing juices from 18 health-giving herbs, roots, and barks. It is taken before meals and mixes with the food in one's stomach, thus helping to eliminate the poisons that foster stomach troubles and to permit the kidneys and liver to function properly. It usually acts within 10 minutes to stop gas pains, sourness, bloating and belching. Users say it will not gripe or nauseate you like ordinary liver medicines. It tends to make your liver more active and to clear away the old bile from your system. At the same time, Giljan helps relieve sluggish kidneys and backache, caused by poor elimination.

Giljan is recommended and sold by all Marshall Drug Stores. Help yourself to health. Start today by buying a bottle of Giljan. One bottle will convince you. Get the family size and save the price of a bottle. The Giljan Medicine Company, Keith Bldg., Cincinnati, O.



MARSHALL DRUG STORES

Mr. Kellough's testimonial.

should lose no time in taking it." Perhaps Mr. Kellough did lose time; the results indicate that he might better have advised, "Any person having trouble such as mine should waste no time or money on Giljan."

What is Giljan, which Mr. Kellough praised so fulsomely? What is the remedy which allegedly cleared up his backache, constipation, sour stomach and gas pains but failed to save his life? According to the carton front reproduced (in reduction) on this page, it is a "laxative herbal compound," though at least three of the ingredients listed—sodium benzoate, glycerine and saccharin—are hardly to be classified as herbal. Some of the other components named are outmoded in modern therapy, and altogether the combination of twenty declared substances recalls the old time "shot-gun" mixtures. Yet the carton declares it to be "compounded by Registered Pharmacists for Giljan Medicine Company, Cincinnati, Ohio."

That at least one government agency has objected to some of the Giljan publicity is seen in the complaint issued Sept. 16,

1944 by the Federal Trade Commission against the Giljan Medicine Company, Inc., its officers and their advertising agency on the charge that their newspaper and radio promotion contained false representations. Among these were that Giljan is a natural medicine and made from a new scientific formula, the ingredients of which substantially aid in giving health to the user; that the product is a cure for stomach trouble in its various forms, constipation, rheumatism, neuritis and liver and kidney ailments in general and also effective in relieving headaches and lack of energy; that it aids proper functioning of the kidneys and liver, clears old bile out of the system, strengthens the nerves, improves the appetite, relieves digestive disorders and has brought relief to 87 per cent of those who have used it. The complaint further charged that the preparation is an irritant laxative with no therapeutic value beyond that which a laxative offers, and that the advertisements are false for the further reason that they fail to reveal that Giljan is potentially dangerous when taken in the presence of abdominal pain, nausea or other symptoms of appendicitis.

Here a glance at the Giljan concern's antecedents is worth while, since they have some bearing on this latest endeavor of one Gilbert H. Mosby in the nostrum field. On May 26, 1942, according to official records, he and two others incorporated the Mosby Medicine Company in Ohio, and on June 5, 1943 the name was changed to Giljan Medicine Company, Inc. The incorporators were reported as Gilbert H. Mosby, Samuel Stulbarg and Benjamin S. Schwartz, the latter designated also as the statutory agent.

Giljan

LAXATIVE HERBAL COMPOUND

ACTIVE INGREDIENTS:
Cascara Bark, Senna Leaves, Aloe, Mandrake, Cayenne Pepper. **ALSO CONTAINS:** Barberry, Gentian, Wild Cherry Bark, Sassafras, Burdock, Licorice, Poke Root, Juniper Berries, Sodium Benzoate, Glycerine, Saccharin, Methyl Salicylate, Oil Camphor, Sassafras Caramel.

Net Contents 8 Fl. Ounces

PRICE \$1.35

COMPOUNDED BY
REGISTERED PHARMACISTS

FOR

GILJAN MEDICINE COMPANY
CINCINNATI, OHIO

Carton front of Giljan.

Friday, July 21, at 3 p. m.
KELLOGG, Alexander—Beloved husband of
of George
Mrs. Marie
Mrs. Glens
passed away
Morris Block
Friends may
Home, 1261
area will be held Saturday, July 22, at 11
2:30 p. m.
LEAHY, Private Thomas C. — Arr.

Mr. Kellough's death notice.

When the Mosby concern was incorporated, Mosby himself was said to be "broke" and to have been backed financially by Stulbarg and a George B. Remus. It was further reported that Mosby called himself general manager of the company but refused to divulge the name of the president, who apparently turned out to be a Henry S. Dunlap. It appears that the "Giljan"

in the title "Giljan" was taken from Mosby's first name (Gilbert) and the "Jan" for Janice, said to have been the first name of one of his succession of wives. Further, it appears that Mosby was ousted by his partners some time in 1943 and died in June 1944 from the effects of a fall in the street.

But Mosby's record in the "patent medicine" field far antedated Giljan. Around 1927 he began to tell the world about the wonderful benefits to be gained by taking his "Konjola," advertised as the "surprising new medical preparation." It was claimed to contain no fewer than thirty-two ingredients, thus putting to shame the later Giljan, with its mere twenty, some of which were in Konjola. The advertising of Konjola abounded in testimonials, and one, published in the Meadville (Pa.) *Tribune-Republican* on Aug. 20, 1929 and enhanced by the Konjola concern's boast "Another victory for Konjola in a seemingly hopeless case after all the others failed," came from a man who had died three weeks before the testimonial appeared!

When Konjola had about run its course, Mosby appears to have shelved it for another nostrum, "Indo-Vin," which likewise was represented to be a mixture of thirty-two ingredients—perhaps the same thirty-two which comprised Konjola. Indo-Vin, however, seems to have been short lived, and ere long Mosby was introducing "Van-Tage," another "tonic." This time he was in the Far West and advertising "At Hollywood, capital of the motion picture world, Van-Tage is a sensation. This medicine is made there. The Immense Van-Tage Laboratories are located at Hollywood. So the stars of the screen are intimately acquainted with this Great Compound." These claims appeared in an advertisement which featured the testimonial of the stage and screen comedian Robert Woolsey. But within two years Woolsey died and his testimonial lost its kick. Another pan of praise for Van-Tage came from a Tom Nick and was featured in an advertisement in the Butte (Mont.) *Standard* Nov. 25, 1936, four days after another Butte paper had published an account of his funeral!

Thus the sordid procession passes in review—Konjola, Indo-Vin, Van-Tage, Giljan. Doubtless the sequence would have added a few new names had Mosby survived—and a few more death notices appearing with or prior to the corresponding testimonials. Funny, isn't it? But the reality is tragic!

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Bel-Din.—This is a product of the Montrose Sales Company, Inc., trading as Montrose Products Company, Montrose, Calif. In January 1944 the concern and Guenther Bradford & Company, Chicago, an advertising agency, stipulated with the Federal Trade Commission to cease representing that the product will have any effect on the symptoms of asthma unless cardiac asthma is specifically excluded, or that it will relieve the symptoms of bronchial asthma beyond easing the difficulty in coughing and breathing. Also to be discontinued was any advertisement which did not reveal that the preparation is potentially harmful and should not be used by those having tuberculosis or goiter; provided, however, that such advertisement need contain only the statement, "Caution: Use Only as Directed" when the same warning appears in the labeling.

Benaris.—G. Bernardi of Cleveland, who puts out this product, stipulated with the Federal Trade Commission in January 1944 that he would discontinue any advertisement which did not clearly reveal that the too frequent or continued use of Benaris may cause nervousness, restlessness or sleeplessness; that its excessive use may cause injury to the lungs; that persons suffering from high blood pressure, heart disease, diabetes or thyroid trouble, or having a high fever should not use it except on the advice of a physician; also that without such advice the

product should not be used when hoarseness or a cough has persisted for ten days. The stipulation provided, however, that such advertisement need only contain the statement, "Caution: Use Only as Directed" if the labeling directions bear a similar warning.

Bondease.—That this product will stop ringworm and athlete's foot or relieve swollen feet, itching or burning skin or tired or sore feet (unless limited to such conditions when due to fungus infection) are misrepresentations which the Bond Pharmacy Company, Little Rock, Ark., which puts out the product, agreed to discontinue in a stipulation that it entered into with the Federal Trade Commission in February 1944.

Diopreen.—This preparation for "promotion of personal hygiene" is put out by Roycemore Toiletries, Inc., trading as Shy Products Company, Chicago. In December 1943 the concern stipulated with the Federal Trade Commission that it would cease representing that Diopreen contains 7 grains of oxyquinoline sulfate per tablet or that the amount of this or any other ingredient of the preparation is in excess of that actually contained therein; that oxyquinoline sulfate is recognized by or described in the United States Pharmacopeia, or that the company manufactures any preparation or article of merchandise unless it owns and operates or directly controls the plant in which the products it sells are made.

Godefroy's Larieuse Hair Coloring.—That this product "ends gray hair," "puts an end to dingy, off-color hair" or will correct "dull, gray-streaked hair" were claims which the Godefroy Manufacturing Company of St. Louis agreed to discontinue in a stipulation that it entered into with the Federal Trade Commission in January 1944. The stipulation recognized that such claims would tend to give the impression that the product will do more than dye the exposed hair to which it is applied, or that its use will cause the hair shaft, as it grows from the scalp, to be similar in color, type or condition to that part of the shaft to which the product has been applied.

Gotu Kola.—A stipulation regarding this was entered into in January 1944 with the Federal Trade Commission by George W. Moody of Pensacola, Fla. In this Moody agreed to cease representing that this herbal product has therapeutic properties in excess of what it actually possesses, or that the medical profession generally has knowledge of and uses or praises it; that it will increase the vitality of a person 70 or 80 years old to that of a 40-year-old individual; that it will bring about perpetual youth, exercise an energizing effect on the brain cells, revitalize worn-out bodies, prevent nervous breakdown or be an effective treatment for mental troubles, blood pressure, rheumatism, elephantiasis, bruises, fever, ulcers, leprosy, skin diseases, jaundice, neuritis or heart trouble, increase the span of human life or "pep up" the glands.

Granaya with Cascara.—This is a product of E. R. Squibb & Sons, New York, who in January 1944 stipulated with the Federal Trade Commission that they would discontinue any advertisement which did not reveal that the product should not be used when abdominal pain, nausea or other symptoms of appendicitis are present; provided, however, that the advertisement need only contain the statement, "Caution: Use Only as Directed" when the labeling instructions for use carry a warning to the same effect.

HQZ Hair and Scalp Oil, HQZ Shampoo, and HQZ Lustre.—These products were the subjects of a stipulation entered into with the Federal Trade Commission in January 1944 by HQZ Laboratories, Inc., and Rufus Rhoades and Robert Davis, trading as Rufus Rhoades & Company and Rhoades & Davis, advertising agency, all of San Francisco. In the stipulation the respondents agreed to cease representing that the Hair and Scalp Oil penetrates into the scalp pores or hair follicles, loosens dirt, grease and dandruff imbedded there, and opens clogged pores; that the Hair and Scalp Oil and the Shampoo, used singly or in combination, will rejuvenate the hair, bring to the surface any grease or other foreign substance lodged in the scalp pores, solve the dandruff or other "hair trouble" problems, prevent dandruff or falling hair, or impart any therapeutic benefit to the hair or scalp; that the presence of alcohol, alkaline soap or heavy oil in competitive products causes them to be harmful, or that HQZ Laboratories, Inc., owns, operates or controls a laboratory.

Laxatrate.—In March 1944 E. A. "Billy" Hamburg, trading as Vegetates Company, Los Angeles, stipulated with the Federal Trade Commission that he would discontinue any advertisements of this product which did not reveal that it should not be used when abdominal pains, nausea or other symptoms of appendicitis are present. The stipulation, however, permitted the statement in the advertisement, "Caution: Use Only as Directed," if the directions on the label should contain a warning to the same effect.

Milky Way Permanent Wave Solution.—This product is put out by Edwin K. Latz, Israel A. Latz and Sidney Seligman, trading as Seligman & Latz, New York City. A stipulation which they entered into with the Federal Trade Commission in January 1944 provided that they would cease representing that their product nourishes the hair and cannot injure it, and that the method of applying it is new or revolutionary. Further, they agreed to discontinue using the word "certified," which would give the impression that the product has been endorsed as to quality or fitness by any governmental, scientific or other recognized agency, or the words "Milky Way" or "milky bath" as part of the designation of the product, or representing through the use of picturizations or otherwise that the preparation is milk or contains milk.

Shasta Armenian Culture.—That this is nature's own balanced food, a life-prolonging item of diet, has destructive action on putrefactive bacteria in the intestinal tract and will rebuild the blood, nerves and glands were representations which S. Leila Hoover, Redwood City, Calif., agreed to discontinue in a stipulation that she entered into with the Federal Trade Commission in March 1944.

Correspondence

"MOBILE X-RAY UNITS IN INVASION"

To the Editor:—In THE JOURNAL, July 8, there appears on page 711, under the heading "Mobile X-Ray Units for Invasion," the following statement: "Hospitals in the field are unable to carry enough x-ray equipment to handle peak loads of patients. . . ."

I commanded an evacuation hospital in Italy throughout the Salerno-Cassino phase of the campaign. While in the combat zone, supporting the Fifth Army offensive closely, we had several peak loads of casualties during December 1943 and January 1944. On one occasion over 200 patients were admitted daily on three successive days.

Rain, gumbo mud, cold and litter carry in blackout were incidental problems encountered in this hospital, functioning entirely under tentage in the field. Thanks to the excellent prior planning, departmental organization and previous improvisation of equipment by Capt. Alfred A. J. Den, M. C., chief of the x-ray department, this department not alone kept abreast with the shock tents but was at all times one to one and a half hours ahead of the surgery for cases requiring operation.

At least one hospital in the field, therefore, was able to carry enough x-ray equipment to handle peak loads. It is not my purpose to belittle the work of Colonel Allen or the mobile x-ray units he has planned but to show that, by anticipating a possible situation and organizing to meet it, a hospital in the field can efficiently carry out its mission even during peak loads in the x-ray department.

JOHN W. McKOAN JR., Colonel, M. C., A. U. S.

DIRECTORY OF MEDICAL SPECIALISTS

To the Editor:—The biographic data of the first two editions of the Directory of Medical Specialists include only positions (internships, residencies or assistantships) held during the course of training of men up to the time of their certification by the American boards, and hospital and medical school staff positions then currently held.

It is desired to extend these data in the third edition to include all formal hospital and medical school appointments, with dates held, even though now resigned, as well as records of all military service including commissions and dates, either in World War I, peacetime in the Reserve forces or in the present war.

Thus a chronologically complete sketch of a certified specialist's entire career is to be included in this third edition of the directory.

Membership or fellowship in national or sectional (not local) special societies and national general societies with offices held, and dates in any of these, should be reported.

Membership in recognized international medical societies may be included, but honorary or other membership in foreign medical societies should not be reported.

Reference to the second edition (1942) of the directory may be made for lists of medical societies to be included in one's biographic sketch.

Families or secretaries of men absent in military service are asked to complete or correct previous listings or new forms now being mailed to those eligible for inclusion in the directory. Only those certified by an official American board can be included, and there is no charge for this listing.

Communications should be addressed to the Directory of Medical Specialists, 919 North Michigan Avenue, Chicago 11, Illinois.

PAUL TITUS, M.D.

Editor, Directory of Medical Specialists.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and of Examining Boards in Specialties were published in THE JOURNAL, Sept. 30, page 318.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Oct. 24-26. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARKANSAS: * Little Rock, Nov. 9-10. Sec., Dr. D. L. Owens, Harrison.

CALIFORNIA: * Written. Sacramento, Oct. 17-19. Oral. San Francisco, Nov. 15. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

CONNECTICUT: * Medical. Written. Hartford, Nov. 14-15. Endorsement. Hartford, Nov. 28. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. Homeopathic. Derby, Nov. 14-15. Sec., Dr. J. H. Evans, Hartford 6.

DELAWARE: Dover, Oct. 10-12. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * Washington, November. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, Nov. 20-21. Sec., Dr. Harold D. Van Schaick, 2736 S.W. Seventh Ave., Miami 36.

IDAHO: Boise, Jan. 8-11. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Oct. 10-12. Supt. of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Jan. 3-5. Exec. Sec., Board of Medical Registration and Examination, Miss Ruth V. Kirk, 301 State House, Indianapolis 4.

KANSAS: Nov. 2-3. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

MAINE: Portland, Nov. 14-15. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MARYLAND: Homeopathic. Baltimore, Dec. 1-3. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 14-17. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MINNESOTA: * Minneapolis, Oct. 17-19. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: Jackson, Oct. 16-17. Asst. Sec., Dr. R. N. Whitfield, Jackson.

NEVADA: Carson City, Nov. 6. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW JERSEY: Trenton, Oct. 17-18. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, Oct. 9-10. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Oct. 16-19. Sec. Dr. R. R. Hannon, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OREGON: Portland, Oct. 20-21. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland 4.

SOUTH DAKOTA: * Pierre, Jan. 16-17. Sec., Medical Licensure, State Board of Health, Dr. G. Cottam, Pierre.

TEXAS: Dallas, Nov. 15-17 and Dec. 19-21. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT: New Haven, Oct. 14. Address State Board of Health Arts, 250 Church Street, New Haven 10.

DISTRICT OF COLUMBIA: Washington, Oct. 23-24. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: Gainesville, Nov. 4. Final date for filing application is Oct. 20. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, Oct. 10. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Oct. 13-14. Sec., Miss Edith LeBeau, 101 N. Walnut St., Lansing.

NEW MEXICO: Santa Fe, Feb. 12. Sec., Miss Marion M. Rhea, State Capitol, Santa Fe.

OREGON: Portland, Nov. 4. Sec., Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Nov. 15. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Aberdeen, Dec. 1-2. Sec., Dr. G. M. Evans, Yankton.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Gonorrheal Infection in Eyes Weakened by Industrial Injury Compensable.—In the course of his employment on April 30, 1942 some fluid used for a wood preservative splashed up into Graham's face and eyes. He was treated immediately at a first aid station maintained by his employer and again the next day by an "eye specialist," who discharged him May 3 as "being able to work." Two days later Graham returned to the physician and his right eye was found to be infected with gonorrheal germs. It is undisputed that Graham did not have any venereal disease and that the infection came from some source other than the workman. The infection spread to the left eye on May 8. As a result of the infection Graham eventually lost the sight of his left eye. He instituted proceedings under the workmen's compensation act of Arkansas and was awarded compensation by the workmen's compensation commission, which, among other things, found that

"It is recognized that gonorrheal infection, unless checked, will produce blindness" and "it is reasonable to assume that the infection found a ready portal of entry in the already inflamed and irritated eye of this claimant. In the opinion of the commission, the chain of causation has been established by this claimant, the liquid which was being used in his employment produced the irritation that offered a ready harbor for the gonorrheal infection that spread to the left eye and produced the blindness in the claimant's left eye."

The employer and his insurance carrier appealed to the circuit court, Phillips County, Ark., which affirmed the award of compensation. An appeal to the Supreme Court of Arkansas followed.

The employer and his insurance carrier contended that the award in favor of the workman should be reversed for two reasons: (1) It is speculation and conjecture for the commission to say that the irritated condition of the eyes, due to the industrial accident, made them more susceptible to the infection, and that blindness would not have occurred except for the irritation; and (2) even assuming the commission was justified in so finding, the germ infection was an intervening efficient cause, for which the employer would not be liable. With respect to the contention that it was speculation and conjecture for the commission to hold that except for the irritated condition of the eyes blindness would not have occurred, the court pointed out that while no witness testified that the irritation to the eyes made them more susceptible to gonorrheal infection it thought the commission had the right in the exercise of sound judgment and discretion to make the finding in this regard that it did make. It seems to us, said the court, a reasonable assumption that an inflamed and irritated eye, a conjunctivitis, would be a ready portal of entry for the germ that did attack the workman, or some other germ that he might have acquired. To support their contention that the germ infection which caused the blindness in the left eye was an intervening efficient cause which excused them from liability under the workmen's compensation act, the employer and his insurance carrier cited a number of cases, including *Bunge Bros. Coal Co. v. Industrial Commission*, 306 Ill. 582, 138 N. E. 189, to the effect "that an employee can only recover for a disability that is caused entirely by the accident which he received in his employment and that the employer is not responsible for any part of the disability that has been occasioned by another independent agency that has intervened after the accident occurred." In the *Bunge* case, said the court, the claimant was injured on March 8, 1920 in a

collision between a coal wagon he was driving and a street car. On the following July 15 his physician found him infected with acute gonorrhea of recent origin and on August 12 found the workman suffering with acute gonorrheal arthritis. In this connection the Illinois court said:

The proof is also to the effect that he (claimant) has suffered greatly from gonorrheal arthritis, and that the inflammation and swelling of the joints was occasioned by a new and independent cause, which occurred weeks after he received his injury.

So, continued the Supreme Court of Arkansas, it will be seen that the intervening efficient cause in the Illinois case occurred more than five months after the original compensable injury and had no connection with it. It was on these facts that the Supreme Court of Illinois used the language quoted. In a recent case decided by this court, *Garrison Furniture Co. v. Butler*, 177 S. W. 2d 738, Butler received superficial wounds on his hands while at work on April 16-17, 1942. On April 20 he consulted a physician and was sent to a hospital on April 21, where he died April 29 from lockjaw as a result of tetanus infection which entered the blood stream through the so-called superficial wounds. This court affirmed an award of compensation. It seems to have been assumed by counsel and the court in that case that if the tetanus bacilli gained entrance into the blood stream through the wounds on Butler's hands and caused his death and that if the wounds were received by him in the course of employment, compensation was properly awarded. The question there was: Did Butler receive his wounds to his hands from an accident injury arising out of and in the course of his employment? There was no question as to an intervening efficient cause. The injuries to Butler's hands were slight and superficial, but they formed a ready portal of entry for the tetanus bacilli, just as the inflamed and irritated eyes of Graham rendered them more susceptible to the entry of the gonorrheal germ.

The court, believing that the commission was justified in finding that there was a causal connection between the original injury and the resulting blindness in the left eye and that compensation was properly awarded, accordingly affirmed the judgment in favor of the workman.—*Pekin Wood Products Co. v. Graham*, 181 S. W. (2d) 811 (Ark., 1944).

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 8-12. Dr. W. L. Benedict, 102 Second Ave. S.W., Rochester, Minn., Secretary.
- American Academy of Pediatrics, St. Louis, Nov. 9-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.
- Annual Conference of State Secretaries and Editors, Chicago, Nov. 17-18. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.
- Association of American Medical Colleges, Detroit, Oct. 23-25. Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary.
- Association of Military Surgeons of the United States, New York, Nov. 2-4. Col. James M. Phalen, Army Medical Museum, Washington 25, D. C., Secretary.
- Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 17-20. Dr. Arthur G. Sullivan, 16 N. Carroll St., Madison, Wis., Managing Director.
- Midwestern Section of American Federation for Clinical Research, Chicago, Nov. 2. Dr. Richard H. Lyons, University Hospital, Ann Arbor, Mich., Secretary.
- Oklahoma City Clinical Society, Oklahoma City, Oct. 23-26. Dr. L. C. McHenry, 512 Medical Arts Bldg., Oklahoma City, Secretary.
- Omaha Mid-West Clinical Society, Omaha, Nebraska, Oct. 23-27. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha 2, Secretary.
- Southern Medical Association, St. Louis, Mo., Nov. 13-16. Mr. C. P. Loran, Empire Building, Birmingham 3, Ala., Secretary.
- Virginia Medical Society of, Richmond, Oct. 23-25. Miss Agnes V. Edwards, 1200 E. Clay St., Richmond 19, Secretary.
- Western Surgical Association, Chicago, Dec. 1-2. Dr. Arthur R. Metz, 250 East Superior St., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

208:1-140 (July) 1944

- Preventive Medicine in Britain A S MacNalty—p 1
Capillary Permeability in Myxedema K Lange—p 5
Factors Influencing Return of Tolerance for Glucose in Middle Aged Obese Diabetics M B Handelsman, with technical assistance of D Schultz—p 15
Relationship Between Hormonal Abnormalities and Accidents of Late Pregnancy in Diabetic Women O W Smith, G V S Smith and D Hurwitz—p 25
Diabetes Mellitus Associated with Albright's Syndrome (Osteitis Fibrosa Disseminata, Areas of Skin Pigmentation and Endocrine Dysfunction with Precocious Puberty in Females) Report of Case F B Peck and C V Sage—p 35
Note on Irradiation Sickness W B Bean, T D Spies and R W Vilter—p 46
New Practical Method for Subcutaneous Administration of Heparin Preliminary Report L Loewe and P Rosenblatt—p 54
Meningococcus Infections with Articular Complications M J Fox and J Gilbert—p 63
*Primary and Symptomatic Amyotrophic Lateral Sclerosis—Clinical Study of 81 Cases I S Wechsler, M R Spirstein and A Stein—p 70
*Electrocardiographic Changes Following Artificial Hyperpyrexia A H Clagett Jr—p 81
*Concentrated Red Cell Transfusions M L Binder and A Klein—p 95

Amyotrophic Lateral Sclerosis—Wechsler and his associates studied 81 patients with amyotrophic lateral sclerosis personally observed between 1939 and 1942. Of this group they designate 68 as primary, the rest, although also fairly typical clinically, are regarded as symptomatic. They rigidly excluded cases of progressive spinal muscular atrophy and lateral sclerosis. They arrived at the conclusion that amyotrophic lateral sclerosis is not one disease entity dependent on one etiologic factor but a syndrome of varying etiology. The largest group consists of so called degenerative cases, some of which may possibly be the result of selective deficiency. Smaller groups may be the result of inflammatory processes or vascular changes. An even smaller group may possibly be toxic in nature. Amyotrophic lateral sclerosis, progressive muscular atrophy and uncomplicated lateral sclerosis are three different entities. The first is comparatively rapidly progressive and invariably fatal, the other two are chronic and last many years. While the intensity and extent of fibrillations often reflect the gravity of the disease, there is no constant parallelism between them and one cannot prognosticate on the basis of fibrillations alone. In many cases pseudobulbar manifestations may signalize the onset of amyotrophic lateral sclerosis. These studies confirm the want of parallelism between presence of active deep reflexes, absence of abdominal reflexes and a Babinski sign, despite involvement of the pyramidal tracts. The first always is present, the second two may or may not be.

Electrocardiographic Changes Following Artificial Hyperpyrexia—Clagett describes electrocardiographic studies in 86 patients who received 118 sessions of fever. Electrocardiograms were taken routinely on all patients before and after fever therapy. Tracings also were taken following conditioning fevers, since these offered an opportunity to study the effect of fevers differing in duration and intensity. Of 80 tracings taken following therapeutic fever, 64 showed insignificant changes, 7 showed significant changes and 9 showed no change whatever from the prefever tracing. The results of previous workers who claimed that the ST segment was almost always depressed following fever were not confirmed. It was found that there was a slight increase or decrease in the amplitude of the P waves and the QRS complexes and that the ST segment was depressed in a few cases. The most constant change

observed was an increase in the value of Bazett's K, an index of the duration of electrical systole. The authors discuss the effects of jaundice, acid-base balance and cardiac rate on the postfever electrocardiograms. Three cases with myocardial damage following fever therapy are presented. In 2 of the 3 almost complete recovery had apparently occurred when a relapse occurred in each, thirty-nine and fifty-six days respectively after fever. In cases of myocardial damage due to fever a good prognosis should not be given merely because the patient is young and the causative agent (fever) has been removed. The treatment of these cases should be the same as that given myocardial infarction due to any other cause. The authors also present 6 cases that showed transient and significant electrocardiographic changes following fever. They consider it highly probable that these transient changes were not on the basis of myocardial damage but rather due to temporary myocardial anoxia, possibly of a relative nature due to the tachycardia.

Concentrated Red Cell Transfusions—Concentrated red cell preparations used by Binder and Klein were obtained from regular hospital donors. The Fenwal apparatus, a semiclosed system, was used to collect 500 cc of blood in 50 cc of 5 per cent sodium citrate solution. The blood was typed by the open slide microscopic method and then stored at 4 to 6 C. The blood selected was from 2 to 7 days old. Before preparation the donor's blood was cross matched with that of the recipient. The plasma was aspirated off under sterile precautions into a pooling flask, the pipet was then inserted to the bottom of the bottle and the red cells were aspirated into a different bottle. The cells obtained from one donor blood in this way were called one donor unit of concentrated red cells. The concentrated red cells were either used immediately or returned to the refrigerator. The concentrated red cells were never kept longer than two days after preparation. They were administered in regular Upjohn recipient sets. The authors did not find it necessary to dilute the concentrated red cells in order to maintain the flow. The regular transfusion procedure was varied only by elevating the blood reservoir about 3 feet higher than usual to obtain a greater pressure. Thirty minutes was the average time required to administer each donor unit. Experience with 124 transfusions demonstrated that they are as efficacious as whole blood in raising the hemoglobin of anemic patients in whom only the cellular elements of the blood are deficient. The same amount of hemoglobin can be supplied in a smaller volume of transfused fluid. Concentrated red cells are of definite value in relieving anemia of patients with a reduced cardiac reserve, by reducing the chances of the production of cardiac failure and pulmonary edema. Theoretically it would also be of value to use concentrated red cells for patients who have recently bled and in whom there is danger of dislodging a newly formed clot by increasing too greatly the volume of circulating fluid with quantities of whole blood. Concentrated red cell transfusions have their limitations. They should not be used for acute blood loss until the blood volume has returned to normal and the only deficit is in hemoglobin. Their use is contraindicated in shock, burns and when the plasma proteins are below normal. The use of concentrated red cells is not limited to elevating the hemoglobin level. Evans reported that they are efficacious in controlling bleeding and other purpuric manifestations of blood dyscrasias. The authors have observed the same beneficial results in a case of monocytic leukemia.

American Journal of Ophthalmology, Cincinnati

27:687-802 (July) 1944

- Prosis—Post Traumatic and Hysterical F B Smyth—p 687
Exophthalmos of Hyperthyroidism. Differentiation in Mechanism Pathology, Symptomatology and Treatment of Two Varieties Part II, J H Mulvany—p 693
Physiology and Treatment of Tobacco-Alcohol Amblyopia Part I F D Carroll—p 713
I Metastatic Carcinoma of Choroid II General Metastasis from Melanoma of Abdominal Wall with Paresis of External Rectus Muscle III Rubeosis Iridis with Melanoma of Choroid and Secondary Glaucoma F C Elliott—p 726
Surgical Control of Glaucoma in Negro C F Hiff—p 731
Report on Family with Ectopic Lenses C A Chapp—p 741
Simple Test for Binocular Fixation Clinical Application and Interpretation Appraisal of Ocular Dominance, Amblyopia, Exotropia and Strabismus and Malingerism S R Irvine—p 749
Relationship Between Bacteriology of Conjunctiva and Nasal Mucosa Special Reference to Certain Extracellular Inflammatory Diseases Berens and Edith L. Nelson—p 747

American Journal of Pathology, Ann Arbor, Mich.

20:665-822 (July) 1944

- Calcification of Media of Human Aorta and Its Relation to Intimal Arteriosclerosis, Aging and Disease H. T. Blumenthal, A. I. Lansing and P. A. Wheeler.—p. 665
- Cushing's Syndrome with Possible Pheochromocytoma: Report of Case P. M. LeCompte.—p. 689
- Keratoderma Blennorrhagicum: Report of Case with Autopsy. J. L. Carr and M. Friedman.—p. 709
- Periarthritis, Nodosa in Experimental Hypertensive Rats and Dogs C. R. Smith, Pearl M. Zeek and J. McGuire.—p. 721.
- Reactions of Blood and Organs of Dogs After Intravenous Injections of Solutions of Methyl Celluloses of Graded Molecular Weights W. C. Hueper.—p. 737.
- Spontaneous and Transplanted Reticulum Cell Sarcoma in Wistar Rats E. J. Farris and E. H. Yeakel.—p. 773.
- Nonsuppurative Nodular Panniculitis (Weber-Christian's Disease). D. M. Spain and J. M. Foley.—p. 783
- Multiple Primary Liposarcomas L. V. Ackerman.—p. 789
- True Hermaphroditism Report of Case with Mammary Carcinoma. J. D. Moriarty.—p. 799.
- Effects of 3,4 Benzpyrene on Wound Repair in Skin of Mice. M. Silberberg and Ruth Silberberg.—p. 809

American Journal of Public Health, New York

34:693-816 (July) 1944

- International Vital Statistics of Future. F. E. Linder.—p. 693.
- Army Field Water Supply Developments H. H. Black.—p. 697.
- Nutritive Value of Brined and Fermented Vegetables. I. D. Jones and J. L. Etchells.—p. 711.
- Factors Affecting Germicidal Efficiency of Chlorine and Chloramine. G. R. Weber and M. Levine.—p. 719.
- Housing Problems of Interest to Public Health Engineer. M. A. Pond.—p. 729.
- Further Evaluation of EC Medium for Isolation of Coliform Bacteria and Escherichia coli C. A. Perry and A. A. Hajna.—p. 735.
- Industrial Hygiene in Postwar World J. G. Townsend.—p. 739.
- Proposed Report on Educational Qualifications of Medical Administrators of Specialized Health Activities W. P. Shepard.—p. 746.
- Fly Borne Bacillary Dysentery Epidemic in Large Military Organization. D. M. Kuhns and T. G. Anderson.—p. 750

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

28:397-528 (July) 1944

- Sulfonamide Resistant Gonorrhea A. W. Frisch, with the technical assistance of R. B. Edwards, M. W. Edwards and Beatrice Behr.—p. 397.
- *Treatment of Acute Gonorrhea in Army. G. Campbell and G. R. Carpenter.—p. 406
- *One Dose, One Day Treatment of Gonorrhea with Sulfathiazole. A. Jacoby and A. H. Ollswang.—p. 413
- Method Using Solid Medium in Delayed Gonococcal Culture Procedure. J. D. Porterfield and E. A. Nelson.—p. 417
- Use of Splenectomized and Nonsplenectomized Mice in Production of Experimental Syphilis in Rabbits U. J. Wile and S. A. M. Johnson.—p. 422
- Biologic False Positive Spinal Fluid Wassermann Reactions Associated with Meningitis: Report of 8 Cases V. Scott, F. W. Reynolds and C. F. Mohr.—p. 431.
- Intensive Treatment of Early Syphilis with Mapharsen Combined with Artificial Fever Preliminary Report N. N. Epstein, R. B. Rees and H. D. Brainerd.—p. 443
- Primary Syphilis of Rectum and Gonorrhea of Anus in Male Homosexual Playing the Role of Female Prostitute A. J. Jones and L. Janis.—p. 453
- Peripheral Vascular Syphilis of Lower Extremities F. H. Grauer and H. L. Myers.—p. 458
- Effect of Fever on Distribution of Arsenic in Tissues of Rabbits Injected Intravenously with Mapharsen H. E. Stokinger, F. L. Dorn, R. A. Bork and C. M. Carpenter.—p. 465

Treatment of Acute Gonorrhea in Army.—Campbell and Carpenter state that in a ten month period 3,270 patients with acute gonorrhea were treated with sulfonamides at Fort Bragg, North Carolina. Following the institution of "duty status treatment" 1,170 cases were treated without hospitalization. The men on "duty status" continued their regular military duties and training while under treatment. Recovery of 79.1 per cent of the men occurred on a single five day course of sulfathiazole (20 Gm.) and an additional 12.5 per cent were rendered asymptomatic by a second similar course, giving a total recovery rate of 91.6 per cent. In the hospital treated cases there was a 10 per cent recurrence rate. "Duty status" treatment was highly successful and resulted in a great reduction of days lost from military duty and a large saving in hospital beds, as 93 per cent of these patients did not require hospitalization. No serious drug reaction was noted. Local treatment was infrequently used and, as a result, complications were rare. Larger doses of sulfonamides for hospitalized patients may effect a higher recovery rate.

One Day Treatment of Gonorrhea with Sulfathiazole.—Jacoby and Ollswang report observations on 69 men whose ages ranged from 17 to 27 years and in whom gonorrhea had existed from one to fourteen days prior to the institution of treatment. The treatment first tried was the administration of 2 Gm. of sulfathiazole four times a day; this was used for 2 patients. The first patient, through a misunderstanding, was given 4 Gm. four times a day. No ill effects were noted. The dosage was then modified so that 4 Gm. was administered twice a day; this was tried on 3 patients. As a further modification, the entire 8 Gm was administered at one time; this was used for 62 patients. Each patient was examined every day thereafter for one week. A urine specimen was examined twenty-four hours after medication. A complete blood count was done before and twenty-four hours after medication. Blood concentration of sulfathiazole was determined twenty-four hours after medication. There was relative freedom from serious toxic reaction. Five patients had minor toxic reaction. None showed anemia, leukopenia or disturbance in the number of granulocytes. Smears and cultures became negative in 35 cases in twenty-four hours, in 9 cases in two days, in 10 cases in three days and in 3 cases in four days. The discharge persisted in 25 patients after the smears and cultures became negative. Fifty-seven of these 69 patients were cured. Positive smears and cultures persisted in 12 patients. These were placed on a routine therapy of 4 Gm. of sulfathiazole daily for five days. Four of these patients were cured, 5 others remained persistently positive, 1 was doubtful, and 1 failed to return.

Archives of Dermatology and Syphilology, Chicago

50:1-78 (July) 1944

- *Penicillin Therapy of Impetigo Contagiosa and Allied Diseases: Use of Penicillium Inoculated Dressing. H. M. Johnson.—p. 1.
- Recurrent Vesicular Eruptions Appearing During Administration of Penicillin W. N. Graves, C. C. Carpenter and R. W. Unangst.—p. 6
- Sulfur in Dermatologic Preparations. J. G. Downing, L. M. Ohmart and M. J. Stoklosa.—p. 8.
- Eczematous Contact Dermatitis Due to Mercurials: Report of Case of Reaction to 10 per Cent Ammoniated Mercury Ointment and Associated with Mercurial Poisoning M. H. Samitz.—p. 10.
- *Immunization Therapy of Warts H. Biberstein.—p. 12
- Treatment of Psoriasis with Sarsaparilla Compound T. S. Saunders.—p. 23.
- Unusual Form of Occupational Dermatitis: Report of Outbreak in Plant Manufacturing Hydrochloric Acid L. Schwartz.—p. 25.
- Keratosis Follicularis Is Not Primarily a Follicular Disease. F. A. Ellis.—p. 27.
- Syphilitic Hepatitis with Unusual Concomitant Manifestations: Report of 2 Cases J. N. Edson.—p. 31
- Dermatitis from Lemon Grass Oil (Cymbopogon Citratus or Andropogon Citratus). H. V. Mendelsohn.—p. 34.
- Turuncular Myiasis O. G. Costa.—p. 36.
- Triple Symptom Complex of Bechet: Report of Case H. Ephraim.—p. 37.
- *Dermatitis Due to Nail Polish: Study of 26 Cases with Chief Allergenic Component Toluene Sulfonamide Formaldehyde Resin and Related Substances H. Keil and L. S. Van Dyck.—p. 39.

Penicillin for Impetigo Contagiosa.—Robinson and Wallace devised moist penicillium inoculated gauze pads to be used topically. Johnson describes his modification in the treatment of 25 patients with common pyoderma. Twelve patients with impetigo contagiosa were clinically clear of infection as early as three days and not later than seven days after the use of the penicillin-containing pads was begun. Four of the patients were previously treated with sulfonamides without improvement. Results for 2 patients with sycosis vulgaris showed promise that this method may become a new means of treating a stubborn recalcitrant infection. Ecthyma, streptococcal lymphangitis, a streptococcal infection of an ear and an abdominal cutaneous wound healed within eleven days. An ulcer of the leg due to Staphylococcus aureus of three months' duration had healed 90 per cent in six weeks after all methods of local therapy had been used. Production of crude penicillin presents many difficulties. Contamination of the pure culture of Penicillium notatum could render it useless and possibly dangerous. Penicillin pads and liquor should be tested for their potency by a ring test before they are used. Topical penicillin therapy will possibly supplant use of sulfonamide compounds or be a valuable adjunct. Absence of local reaction and sensitivity places the mold in a unique situation in comparison with the

sulfonamide compounds. A possible pitfall in the local use of penicillin is the suggested theory that one may become penicillin fast by repeated small applications. This hypothesis can be proved only by time and experience.

Immunization Therapy of Warts.—Biberstein describes an immunization therapy for warts which consists of injections of an extract of the lesions. First results of its use were published in 1924; since then reports have been published repeatedly, including also reports of successful treatment of warts in cattle and horses. He rejects the theory that the results obtained in the treatment of warts were due to suggestion. Many of the methods used may have one important point in common: they act by way of the vegetative nervous system. Results accomplished with injections of an extract of warts and of condylomata acuminata are due to immunizing factors. While this treatment can be used in any case of warts, it is indicated particularly in the presence of an excessive number of warts, in warts in locations in which other methods are impracticable or inadvisable (subungual region, nail wall and plantar region), in warts resistant to other methods of treatment and in recurrences following the administration of other treatments.

Dermatitis Due to Nail Polish.—Keil and Van Dyk report observations in 26 cases of nail polish dermatitis in which they were able to make patch tests with toluene sulfonamide resin and a number of related substances and derivatives. The data support Simon's view that toluene sulfonamide formaldehyde resin is the chief cause of nail polish dermatitis as seen today. The occurrence of so many cases is moreover consistent with the relatively recent introduction of this synthetic resin. In 25 of the 26 subjects, tests with toluene sulfonamide formaldehyde resin, which is not a primary irritant in the concentration used, elicited intensely positive reactions. Hypersensitiveness to this resin is frequently accompanied by group reactions to related chemical fractions and derivatives, such as the condensate of toluene sulfonamide and formaldehyde, toluene sulfonamide and, to a lesser extent, formaldehyde. This principle of group reactions seems also to extend to sulfanilamide. In 1 of 4 subjects with nail polish dermatitis a definite positive reaction was elicited with sulfanilamide; the patient had never used this or related compounds either internally or externally. Toluene sulfonamide formaldehyde resin was established by patch tests as present in one of the straw hat lacquers found on the market. This resin appears not to be present in the hair lacquers which have lately caused instances of contact dermatitis. A person hypersensitive to toluene sulfonamide formaldehyde resin is usually unable to tolerate the majority of nail polishes commonly used. A negative reaction to a patch test with this resin does not eliminate nail polish dermatitis due to another cause.

Archives of Internal Medicine, Chicago

73:433-504 (June) 1944

- *Clinicopathologic Studies of Renal Damage Due to Sulfonamide Compounds: Report of 14 Cases. F. D. Murphy, J. F. Kuzma, T. Z. Polley and J. Grill.—p. 433.
- Importance of Bronchography in Cases of Unresolved Pneumonia. G. S. Grier III.—p. 444.
- *Infectious Mononucleosis: Study of 196 Cases. A. W. Contratto.—p. 449.
- Spontaneous Pneumothorax Complicating Bronchial Asthma: Report of 2 Cases and Consideration of Possible Mechanisms Involved in Its Production. M. Trowbridge Jr.—p. 460.
- Nutritional Problems Presented by Patient with Extensive Jejunoileitis. S. T. Killian and F. J. Ingelfinger.—p. 466.
- Late Cerebral Sequelae of Rheumatic Fever. W. L. Bruetsch.—p. 472.
- Diseases of Heart: Review of Significant Contributions Made During 1943. C. Williams, with editorial assistance of P. D. White.—p. 477.

Renal Damage Due to Sulfonamide Compounds.

Murphy and his co-workers report clinical and pathologic data for 14 patients in whom renal damage developed after therapy with sulfonamide compounds. Thirteen of the 14 patients died and were studied post mortem. Decapsulation of the kidney was done and a biopsy specimen taken of 1 patient who recovered. Most of the commonly used sulfonamide compounds were employed, but sulfathiazole was the most commonly used. The primary disease under treatment was considered to play no part or at any rate a small one in causing the renal damage. The quantity of the sulfonamide compound administered and the

drug level in the blood appeared to be unimportant in producing the renal damage. As much as 41 Gm. and as little as 10 grains (0.6 Gm.) were responsible for fatal renal injury. In a few of the cases deposits of crystals of the drugs in the urinary tract causing some degree of mechanical obstruction were found associated with the nephrotoxic lesion; but this was not the rule, as in most of the cases reported the nephrotoxic lesion was independent of mechanical blocking. Microscopically there was simple tubular degeneration present in all the kidneys regardless of what other changes were present. Advanced tubular degeneration, necrosis of the tubular cells and intense inflammatory reaction outside the nephron in the surrounding tissues occurred in some cases. These various tubular lesions undoubtedly represent degrees in the severity of one process rather than different kinds of response. In 1 case advanced changes in the glomeruli were noted.

Infectious Mononucleosis.—According to Contratto a young adult with symptoms of cold, sore throat and grip should be suspected of having infectious mononucleosis and the necessary laboratory tests should be made. The author and his associates attended a large number of young men suffering from this disease. From 1935 to 1943 there were 12,601 men admitted to the Stillman Infirmary, of whom 249 had a discharge diagnosis of infectious mononucleosis. Of this number 53 were eliminated as not presenting a typical enough picture. Type and severity of symptomatology varied greatly. Sore throat was the most common symptom. Although it did not occur as the presenting symptom in more than 50 per cent of the cases, it developed at some time during the course of the illness in all except 18 per cent. Headache often heralded the onset of the disease. Fatigue and general malaise were frequent. Gastrointestinal symptoms were not prevalent, but anorexia was common. A presenting symptom of stiff or sore neck was usually referable to the swollen cervical lymph nodes. The onset of the lymphadenopathy was usually found in this area and often on the left side. The symptoms of ordinary infections of the upper respiratory tract with nasal congestion, fever and chills were conspicuous. The spleen was palpable in 91 cases. In several cases the spleen was definitely tender. The diagnosis of infectious mononucleosis cannot be made unless either the heterophile reaction of Paul and Bunnell is positive in high dilution or the blood smear is typical. The author stresses the importance of making frequent tests and smears during the course of the illness, since there is often a delay of days or even weeks before the hematologic changes are conclusive enough to permit an accurate diagnosis.

Bulletin of Johns Hopkins Hospital, Baltimore

74:275-320 (May) 1944

- Immunization with Vole Acid Fast Bacillus Against Experimental Tuberculosis. W. S. Brooke and R. Day.—p. 275.
- Favism. H. W. Josephs.—p. 295.
- Experimental Studies on Sulfapyrazine in Mice. G. I. Trevett.—p. 299.
- Observations on Diet Deficient in Both Methionine and Cystine in Man. A. A. Albanese, L. E. Holt Jr., J. E. Brumback Jr., Jane L. Frankston and Virginia Irby.—p. 308.

Bulletin New York Academy of Medicine, New York

20:319-360 (June) 1944

- Indications for Psychoanalytic Therapy. F. G. Alexander.—p. 319.
- Some Psychosomatic and Therapeutic Aspects of War Neuroses. P. H. Hoch.—p. 333.
- Progress in Sulfonamide Prophylaxis of Acute Infectious Diseases. W. D. Sutliff.—p. 348.

20:361-426 (July) 1944

- *Circulation in Traumatic Shock in Man: Harvey Lecture, Feb. 17, 1944. D. W. Richards Jr.—p. 363.
- International Health: Hermann M. Biggs Memorial Lecture. W. A. Sawyer.—p. 394.

Circulation in Traumatic Shock in Man.—Richards describes a technic for measuring in man both the pressure of blood in the right auricle and the total volume flow of blood or cardiac output. These measurements are achieved by means of a long ureteral catheter introduced into a median basilic vein and thence passed along axillary and subclavian veins into the right auricle. The technic was originated by Forsmann with himself as subject more than ten years before. The technic

has been perfected and has proved to be remarkably easy, safe and painless, no serious untoward effects having been encountered in over 250 catheterizations. The research was pursued jointly by three groups: A group under Courmand was responsible for measurements of pulmonary ventilation and respiratory gas exchange, arterial and venous blood gas analyses and the catheterization technic; a group under Gregersen provided blood volume determination by the use of the dye T-1824; a group under Smith provided optical registration of arterial pressure tracings by the use of the Hamilton manometer. In a number of cases renal clearance studies were made by Smith's technic. The clinical material consisted of injured patients admitted to the Bellevue Hospital emergency service. All instances of shock were of the secondary, progressive form. While different injuries led to circulatory failure in different ways, the essential finding in all appeared to be an inadequate venous return of blood to the heart with diminished cardiac output. A deficit in circulating blood volume was responsible. Observations on the vascular bed in shock are summarized as follows: 1. In shock with blood loss there is a tendency to selective vasoconstriction, which is compensatory. 2. This compensation may fail, either gradually or suddenly. The patient in shock is in an unstable state, and the smallest additional trauma or disturbance may have disastrous effects. 3. Elevation of the feet in shock usually raises arterial blood pressure and is beneficial. 4. Drug therapy of shock is not satisfactory at present, but certain drug effects may prove to be helpful for peripheral circulatory failure. 5. Alcohol causes vasodilatation, which is unfavorable. 6. The most effective treatment is replacement of blood volume. When whole blood has been lost in large amounts, replacement by plasma alone will produce an acute anemia. The preference for whole blood in treating these types of injury has been increasingly emphasized in military casualties in this war. Restoration of blood volume brings the patient out of acute circulatory failure but is not complete treatment in itself. There is need for increased amounts of sodium salts and proteins. Fluids, salts and food should be started by mouth in the post-shock state as soon as tolerated. Oxygen therapy is frequently a necessity in chest injury and might be helpful in many cases of burns. The central circulation is better maintained if the volume of blood in the extremities is minimal, and in this sense cool extremities, particularly the avoidance of external heat applied to them, should be beneficial. This does not mean that the body as a whole should be subjected to cold. Exposure to cold affects shock most unfavorably:

Bull. of the U. S. Army Med. Dept., Washington, D. C.

78:1-122 (July) 1944

- Study of Parachute Injuries. C. D. Lord and J. W. Coutts.—p. 57.
Complications of Meningococcal Infections: Analysis of 100 Cases. P. S. Strong and J. L. Hollander.—p. 68.
Diarrheal Diseases in U. S. Troops in Belgian Congo. C. D. Dunham and W. H. Gillespie.—p. 76.
Reconditioning Problem at Oliver General Hospital. S. E. Bilik.—p. 81.
Neuropsychiatrist and Convalescent Training Program of Army Air Forces. A. A. Rosner.—p. 93.
Sulfathiazole for Prevention of Gonorrhea. P. G. Reque and D. Bergsma.—p. 97.
Preparation of Culture Mediums in Field. M. Levine and A. H. Stock.—p. 103.
*Relation of Antisulfonamide Action of Serum to Resistance to Sulfonamide Therapy. D. A. Boroff.—p. 111.

Antisulfonamide Action of Serum and Resistance to Sulfonamide Therapy.—Boroff and his collaborators demonstrated that serums of certain individuals have an antisulfonamide action when tested in vitro. Boroff attempted to correlate this action with the resistance to sulfonamide therapy by certain patients with gonorrheal urethritis. A group of 18 patients with gonorrheal urethritis was selected. Thirteen of them had chronic gonorrhea and had received three or more courses of either sulfadiazine or sulfathiazole or both without apparent effect. The other 5 were patients with acute gonorrheal urethritis who showed no resistance to the drug and who were completely cured by one or two courses of sulfathiazole. From each of the selected patients 25 cc. of blood was taken under sterile conditions, and the serums were studied for antisulfon-

amide action. The results indicate that there may be a relationship between the in vitro manifestation of antisulfonamide action of the serums and the resistance to sulfonamide therapy. The fact that this antisulfonamide action may be measured in the laboratory presents a possibility of predicting the magnitude of the dose of drug necessary for chemotherapy to be effective. The success of the therapy may thus be prognosticated. Potentially resistant cases, instead of being subjected to prolonged and ineffective drug therapy, may be immediately determined in the laboratory and some other form of therapy applied.

Cancer Research, Baltimore

4:401-464 (July) 1944

- Observations on Inhibition of Development of Spontaneous Leukemia in Mice by Underfeeding. J. A. Saxton Jr., M. C. Boon and J. Furth.—p. 401.
Incidence of Spontaneous Fibroadenoma in Albany Strain of Rats. Ethel Burack, M. V. Danzi, J. M. Wolfe and A. W. Wright.—p. 410.
Non-Heme Iron Content of Tissues of Mice of High Cancer and Low Cancer Strains. F. L. Warren and F. Goulden.—p. 417.
Hemoglobin Content of Blood of Mice of RIII and CBA Strains. F. Goulden and F. L. Warren.—p. 421.
Factors Affecting Carcinogenesis: II. Incorporation of 3,4-Benzpyrene in Media Containing Purified Lecithin or Cephalin. H. Weil-Malherbe and F. Dickens.—p. 425.
Spontaneous Tumors of Adrenal Cortex in Castrated Male Rat. J. Heiman.—p. 430.
Racial Distribution of Cancer: I. Epithelial Tumors of Skin, Lip and Breast. R. Schrek.—p. 433.
Clinical Effects of Aldehyde Bisulfites in Patients with Cancer: II. Administration of Heptylaldehyde Bisulfite to Patients with Lymphomas. H. O. Singher, J. C. Abels, L. F. Craver and C. P. Rhoads.—p. 444.
Studies on Tumors of Testis: I. Water and Electrolyte Content of Testicular Tumors and of Normal, Cryptorchid and Estrogenized Testis. C. Huggins and Lillian Eichelberger.—p. 447.

Delaware State Medical Journal, Wilmington

16:73-104 (June) 1944

- Future Role of Mental Hygiene. M. A. Tarumian.—p. 73.
Atypical Case of Involutional Psychosis. P. F. Elfeld.—p. 77.
Enuresis. B. G. Lawrence.—p. 80.
Atypical Neurological Syndromes in Alcoholic States, with Special Reference to Pyramidal Syndrome. G. J. Gordon.—p. 83.
Functional Psychosis in Old Age. M. B. Zimble.—p. 88.
Hypothyroidism Simulating Functional Psychoses. G. S. Bieringer.—p. 93.
Conversion Hysteria in an Individual Suffering from Korsakoff Psychosis. F. A. Freyhan.—p. 95.

Endocrinology, Springfield, Ill.

35:1-72 (July) 1944

- Influence of Hormones on Lymphoid Tissue Structure and Function: Role of Pituitary Adrenotropic Hormone in Regulation of Lymphocytes and Other Cellular Elements of Blood. T. F. Dougherty and A. White.—p. 1.
Metabolism of Steroid Hormones. R. I. Dorfman, B. N. Horwitt, R. A. Shipley and W. E. Abbott.—p. 15.
Experimental Hypothyroidism in Monkey. J. W. Jailer, W. M. Sperry, E. T. Engle and G. Smelser.—p. 27.
Influence of Diet on Cholesterol Concentration of Blood Serum in Normal, Spayed and Hypothyroid Monkeys. W. M. Sperry, J. W. Jailer and E. T. Engle.—p. 38.
Extraction of Cortin-like Substances from Human Postoperative Urine. Eleanor H. Venning, M. M. Hoffman and J. S. L. Browne.—p. 49.
Evidence for Early Testis Hormone Secretion in Rat from Study of Epididymis. E. S. Cieslak.—p. 63.

Illinois Medical Journal, Chicago

85:269-314 (June) 1944

- Pulmonary Embolism: Study of Relation of Occlusion of Pulmonary Artery to Sudden Death. M. Joannides and A. L. Hesse.—p. 279.
Nervous and Mental Manifestations Observed in Spontaneous Hypoglycemia. A. A. Lieberman.—p. 287.
Surgical Complications of Pregnancy. W. G. Cummings and P. H. Smith.—p. 292.
Treatment of Benign Uterine Bleeding in Menopause. J. R. Willson.—p. 295.
Protecting Place of Employment. J. J. Bloomfield.—p. 299.

86:1-80 (July) 1944

- Reversibility of Heart Disease. P. D. White.—p. 9.
Abdominal Tumors of Questionable Origin: Roentgenologic Aspects. A. Hartung.—p. 14.
Health Examination for School Children Required by Law. R. O. Duncan.—p. 17.
Further Observations on Lung Changes in Electric Arc Welders. O. A. Sander.—p. 72.

Journal of Aviation Medicine, St. Paul

15:149-212 (June) 1944

- Comparative Testing of Aviation Oxygen. C. L. Gemmill.—p. 150.
Thyroid Function and Resistance to Anoxia in Rat. A. M. Hughes and E. B. Astwood.—p. 152.
Effect of Partial Hepatectomy on General Resistance and Blood Sugar Level in Rats Exposed to Anoxia. F. Gregoire, C. P. Leblond and E. Robillard.—p. 158.
Effects of Physical Activity and of Simulated Altitudes on Pulmonary Ventilation, Maximal Inspiratory (Peak) Flow and Pressure in Relation to Oxygen Requirements. F. G. Hall and J. W. Wilson.—p. 160.
*Experimental Study on Modifications of Urinary Secretion at High Altitude. J. Malmjac.—p. 167.
Analysis of Aviation Accidents. B. R. Bugelski.—p. 172.
Modern Trends in Teaching of Naval Aviation Medicine. B. Groesbeck Jr.—p. 182.
Review of Activities of the Royal Canadian Air Force Medical Service. F. A. L. Mathewson.—p. 186.
Army Air Force Altitude Training Program. H. S. Wigodsky.—p. 190.
Acute Poliomyelitis Case Transported by Air. V. E. Frazier.—p. 195.

Urinary Secretion at High Altitudes.—According to Malmjac urinary secretion decreases at high altitudes and elimination of nitrogenous wastes is momentarily upset. A series of experiments with dogs was undertaken at the Medical Schools of the Universities of Marseille and Algiers and at the Laboratory of Medicophysiology Research of the French Air Force in Algiers to determine the causes which disturb urinary secretion at high altitudes. Studies were made on the effect of depression on urinary secretion, the role of the renal nervous system, the effects of the secretion of epinephrine, the influence of peripheral physical factors, eventually intervention of various chemical factors, the role of gas bubbles and the like. The observations revealed that barometric depression is followed by a progressive decrease in urinary secretion. This reduction begins to manifest itself at a depression corresponding to an altitude of 12,000 to 16,000 feet. Three major actions occur successively to produce the oliguresis: (a) Nervous action: This is the principal one and the first which can be observed. It brings on renal vasoconstriction, origin of the oliguresis which appears from 12,000 to 16,000 feet. (b) Humoral adrenal action: This appears after the nervous action, when the depression corresponds to an altitude of 24,000 feet. (c) Physical action: This is represented by gas bubbles, which are produced at great depressions corresponding to more than 30,000 feet. These three factors complement one another. They not only bring about a progressive reduction of the urinary secretion but also modify the composition of the urine. The oliguresis has as a corollary the diminution of chlorides, the elimination of which is greatly disturbed. The inhalation of oxygen prevents the effects of the nervous and humoral actions.

Journal of Immunology, Baltimore

48:335-410 (June) 1944

- *Action of Penicillin on Staphylococcus in Vitro. L. A. Rantz and W. M. M. Kirby, with technical assistance of Elizabeth Randall.—p. 335.
Titration of Tetanal Toxins and Toxoids by Flocculation. P. J. Moloney and Joan N. Hennessy.—p. 345.
Agglutination of Antigens from Distemper Infected Dogs and Ferrets by Anticaine Distemper Immune Serums. A. J. Weil, F. Popken and J. Black.—p. 355.
Purification and Character of Swine Influenza Virus. A. R. Taylor, D. G. Sharp, I. W. McLean Jr., Dorothy Beard, J. W. Beard, J. H. Dingle and A. E. Feller.—p. 361.
Specific Precipitation: VI. Restricted System Bivalent Antigen, Bivalent Antibody as Example of Reversible Bifunctional Polymerization. A. D. Hershey.—p. 381.

Action of Penicillin on Staphylococcus in Vitro.—In view of the usefulness of turbidimetric methods for the measurement of the rate of bacterial growth in the study of sulfonamide bacteriostasis, Rantz and Kirby decided that similar techniques might be applied in the determination of the mode of action of penicillin. They used these methods in studying the effects of penicillin on various strains of staphylococci. They found that penicillin is actively bactericidal for the staphylococcus and that lysis of the organism occurs in the course of its action. This has not been demonstrated for the hemolytic streptococcus. Whether this dissolution of the organism is the result of the direct action of penicillin on the cell membrane or is caused by autolytic enzymes present in the bacterial cell that become active as the result of interference with vital bacterial metabolic processes by penicillin cannot now be determined. The latter hypothesis is, perhaps, the more probable since it is known that

staphylococci will, under certain circumstances, undergo spontaneous lysis. In spite of the ease with which enormous numbers of staphylococci can be killed and lysed by small amounts of penicillin, many organisms remain alive even after prolonged exposure to this chemical. The remaining viable bacteria on retesting may be shown to be as sensitive to the action of penicillin as was the parent strain, so that their survival is not the result of artificially induced penicillin resistance. The presence in the blood and tissues of 0.1 to 0.2 unit of penicillin per cubic centimeter would, on the basis of the observations recorded in this report and those of Rammelkamp, in which staphylococci were exposed to the action of penicillin in whole blood and serum, seem to be adequate for the therapy of most clinical infections. It is generally stated that penicillin is not inhibited by serum, body fluids or peptones. The observations described here indicate that lysis occurs somewhat more slowly and that more organisms remain viable after prolonged exposure to penicillin if a rich broth is used rather than the relatively incomplete synthetic medium. When peptones were added to the synthetic medium in increasing concentration, the control organism multiplied more rapidly but penicillin activity was unimpaired. This is in striking contrast to the action of the sulfonamides. It is possible that the constituents of the culture medium have no effect on the inhibitory phase of penicillin action on the staphylococcus but are concerned in the ease with which the agent may induce lysis and killing of the bacteria. The authors conclude that penicillin is an extraordinarily potent agent which in minute amounts induces the death and lysis of staphylococci. That this effect is not complete and that viable organisms remain after prolonged exposure to the drug is unfortunate and may explain certain clinical failures. There is a close correlation between the concentration of penicillin and its activity. By the methods described in this report a great natural variation in the sensitivity of strains of coagulase positive staphylococci to the action of penicillin may be demonstrated the clinical significance of which has not been evaluated.

Journal of Infectious Diseases, Chicago

74:173-256 (May-June) 1944

- Substance in Animal Parasites Related to Human Isoagglutinogens. J. Oliver-González and Mercedes Vincente Torregrosa.—p. 173.
Defective Granular Eggshell Formation by *Schistosoma mansoni* in Experimentally Infected Guinea Pigs on Vitamin C Deficient Diet. C. Krakower, W. A. Hoffman and J. H. Axtmayer.—p. 178.
Mosquito Transfer of Pigeon Strain of *Plasmodium Relictum*. W. B. Redmond.—p. 184.
In Vitro Effects of High Temperatures on Avian Malarial Parasites. F. E. Caldwell.—p. 189.
Feline Pneumonitis (Baker), New Member of Lymphogranulomatosis Group of Agents. Dorothy Hamre and G. Rake.—p. 206.
Survey of Chronic Meningococcus Carriers in Semipermanent Population. C. P. Miller, W. G. Beadenkopf, Dolores Peck and Mary Wright Robbins.—p. 212.
Ontogenetic Change in Antigenic Specificity of Organs of Chick. V. Burke, N. P. Sullivan, Helen Petersen and Ruth Weed.—p. 225.
Observations on Two Epidemics of Infective Hepatitis in Palestine Among Recent Immigrants. I. J. Kligler, D. S. Bresh and W. Koch.—p. 234.
Effect of Type III Pneumococcus Polysaccharide and Gelatin on Circulation and Sedimentation Rate of Erythrocytes in Mice. J. S. Youngner and W. J. Nungester.—p. 247.

Journal-Lancet, Minneapolis

64:215-252 (July) 1944

- Review of Epidemiology of Acute Anterior Poliomyelitis with Reference to Mode of Transmission. K. F. Maxcy.—p. 216.
Central Nervous System in Poliomyelitis and Polioencephalitis. A. B. Baker.—p. 224.
Electromyographic Studies in Poliomyelitis. A. L. Watkins.—p. 233.
Physiology of Spinal Cord with Relation to Poliomyelitis. B. Campbell.—p. 236.
Metabolism of Nervous Tissue in Poliomyelitis. H. G. Wood.—p. 247.
Effect of Muscle Pain on Central Nervous System at Spinal and Cortical Levels. E. Gellhorn.—p. 242.

Journal of Neurophysiology, Springfield, Ill.

7:207-252 (July) 1944

- Analysis of Variability of Spinal Reflex Thresholds. J. S. Dentlow.—p. 207.
Parasympathetic Regulation of High Potential in Electroneurogram. C. W. Darrow, J. R. Green, E. W. Davis and H. W. Gatch.—p. 217.
Electrophonic Response to Phase Reversal. P. Kellaway.—p. 227.
Afferent Path of Pupillodilator Reflex in Cat. A. J. Harris, R. Hoyle and H. W. Morgan.—p. 231.
Changes of Weight and Neuromuscular Transmission in Muscles of Immobilized Joints. P. Thomson and J. V. Luce.—p. 245.

Journal of Nutrition, Philadelphia

28:1-70 (July) 1944

- Production of Hypercalcemia with Small Amounts of Vitamin D. J. H. Jones.—p. 7.
- Efficiency of Utilization of Phosphorus by Albino Rat. L. F. Marcy.—p. 17.
- Metabolic Changes in Growing Chickens. H. H. Kibler and S. Brody.—p. 27.
- *Vitamin Content of Variety Meats. J. M. McIntire, B. S. Schweigert, E. J. Herbst and C. A. Elvehjem.—p. 35.
- *Protein Nutritional Value of Soybean, Peanut and Cottonseed Flours and Their Value as Supplements to Wheat Flour. D. B. Jones and J. P. Divine.—p. 41.
- Utilization of Thiamine in Human Subject: Effect of High Intake of Carbohydrate or of Fat. J. G. Reinhold, J. T. L. Nicholson and K. O'Shea Elsom, with technical assistance of Charlotte Chornock.—p. 51.
- Production of Vitamins in Germinated Peas, Soybeans and Other Beans. C. E. French, G. H. Berryman, J. T. Goorley, H. A. Harper, D. M. Harkness and E. J. Thacker.—p. 63.

Vitamin Content of Variety Meats.—McIntire and his associates analyzed the thiamine, riboflavin and nicotinic acid content of samples of bologna, frankfurters, pork links, beef liver, veal heart, Canadian bacon, various types of sausage, head cheese, oxtail, lamb shank and other variety meats. They found that these meats are a good source of the aforementioned vitamins, containing about the same amounts as fresh muscle meats. Retention of these vitamins in some of the meats was studied during broiling, braising and boiling. Greater amounts of all the vitamins were retained in the meat after broiling than after braising. In the case of boiling the vitamin retention in the meat was dependent on the cooking time. Broiling favored a higher total retention of thiamine than did braising. In nearly every case over 90 per cent of the nicotinic acid and riboflavin was recovered in the meat and drippings.

Nutritional Value of Soybean, Peanut and Cottonseed Flours.—Jones and Divine studied the growth promoting values of the proteins of soybean, peanut and cottonseed flours by the rat growth method and also their values as supplements to the proteins of wheat flour. They found that soybean, peanut and cottonseed flours contain proteins of high nutritive value and offer an excellent means of supplying dietary protein to extend and partially replace protein foods of animal origin. These plant proteins are well adapted to enhance the nutritive value of the proteins of wheat flour. The addition of as little as 5 parts of peanut, soybean or cottonseed flour to 95 parts of wheat flour produced mixtures containing 16 to 19 per cent more protein than wheat flour alone and a protein combination that was definitely superior in its growth promoting value to the same quantity of protein from wheat flour.

Journal of Urology, Baltimore

51:563-666 (June) 1944

- Müllerian Duct Cysts. C. L. Deming and R. R. Berneike.—p. 563.
- Supernumerary Kidney with Clear Cell Carcinoma: M. Exley and W. S. Hotchkiss.—p. 569.
- *Renal Aplasia: Study of 16 Cases. E. F. Nation.—p. 579.
- *Thrombosis of Renal Vein. W. F. Melick and A. E. Vitt.—p. 587.
- Primary Tumors of Kidney. A. L. Shaheen, C. Cassano and J. R. Lisa.—p. 597.
- Renal Hemangioma: Obscure Cause of Hematuria. A. Rottino and H. Mohan.—p. 601.
- Primary Epithelioma of Ureter: Follow-Up Study of 18 Cases with Addition of 9 New Cases. V. S. Counseller, E. N. Cook and P. H. Seefeld.—p. 606.
- Tumors of Ureter. S. McMahon.—p. 616.
- Papillary Carcinoma of Bladder with Extensive Metastases: Case Report; Autopsy. N. P. Rathbun.—p. 623.
- Metabolism of Isolated Prostatic Tissue. E. S. G. Barron and C. Huggins.—p. 630.
- Secondary Carcinoma of Testicle Following Carcinoma of Prostate. I. Helfert and B. M. Pinck.—p. 635.
- Metastasis in Epididymis from Cancer of Prostate: Case Report. M. A. Humphrey.—p. 641.
- Primary Carcinoma of Anterior Male Urethra: Case Report. R. F. Hickey and R. C. Coleman Jr.—p. 643.
- Malaria as Complication in Genitourinary Tract Disease. A. I. Folsom and H. A. O'Brien.—p. 646.
- *Podophyllin Treatment of Condylomata Acuminata. O. S. Culp, M. A. Magid and I. W. Kaplan.—p. 655.

Renal Aplasia.—Nation believes that the term renal aplasia should be reserved for incompletely or defectively developed kidneys to distinguish the condition from renal agenesis, in which no vestige of renal tissue is to be found. There are clinical and embryologic reasons for restricting the use of the

term still further. To distinguish renal aplasia from hypoplasia and secondary atrophy it has been used properly only to denote the presence of tissue of metanephric origin which has never developed renal function or has undergone congenital atrophy. Confusion can be avoided by use of the criteria established by Gutierrez: "No true kidney; no evidence of pelvis; absence of true renal pedicle; renal artery small or absent; ureter incompletely developed and not patent; no excretion of urine; no renal function; histologic section of the supposed renal mass reveals glomeruli and tubules, showing arrest of development of renal organ." All of the cases designated as renal agenesis, aplasia and hypoplasia among approximately 27,000 necropsies performed at the Los Angeles County General Hospital were studied. There were 16 cases of true renal aplasia. Its incidence in this series was about the same as that of renal agenesis. Renal aplasia usually results from failure of proper contact between the ureter (collecting tubule system) and the metanephros. Three cases were bilateral. The right and left kidneys were involved with equal frequency. Nine of the patients were males and 7 were females. Six of the 9 patients living more than one month died as a result of hypertension, each having extensive disease of the functioning kidney. Four patients, 3 females and 1 male, had developmental defects of the genital tract. A case of persistence of the metanephros without a ureter is reported. Renal aplasia can seldom be differentiated clinically with certainty from renal agenesis. Surgical exploration for and removal of an aplastic kidney are indicated (1) for the relief of pain, (2) in patients with intractable hypertension and no evidence of disease of the functioning kidney and (3) in cases of hypertension in which pyelonephritic contracture or renal hypoplasia cannot be excluded.

Thrombosis of Renal Vein.—Melick and Vitt describe a case of thrombosis of the renal vein in which blood prothrombin times were obtained preoperatively. A retrograde pyelogram was secured in a normal fashion within a short time after the onset of the thrombosis, which showed the early roentgenologic changes of renal vein thrombosis. They believe that this is the first time that such a pyelogram has been obtained. In the pyelogram which was made within eighteen hours of the onset, as judged by the pain and tenderness, the swelling had not completely occluded the renal pelvis. The picture showed a renal pelvis irregular in outline and irregularly filled. In adults, renal vein thrombosis may be due to primary hematogenous pyelonephritis, with resultant thrombosis within the renal cortex and later extension to the pedicle. It may also be due to the involvement of the pedicle by infection from rupture of a cortical abscess or a perinephric abscess. Thrombosis of the renal vein may be part of a progressive, ascending inflammatory process involving first the vessels of the pelvis or lower extremity and then the inferior vena cava and its higher branches. In infants the thrombosis is almost always secondary to severe ileocolitis or gastrointestinal upsets. One case in an infant was secondary to a primary pneumonitis. If the possibility of such thrombosis is kept in mind, the diagnosis should be made without difficulty. The onset is usually sudden; there are fever, pain and tenderness in the affected side. On palpation the kidney has been found to be enlarged in every case reported. The kidney is also freely movable and tender. Usually there are signs of infection and severe toxicity. Frank hematuria or microscopic hematuria has been present in almost every case. In infants a history of previous ileocolitis is obtained. In adults the history of a previous thrombophlebitis of the pelvis or lower extremity is a common finding. Immediate nephrectomy seems to be the treatment of choice. A possible aid in the treatment may be the use of an agent such as dicumarol to prolong the prothrombin time. This agent must be used with great caution.

Podophyllin Treatment of Condylomata Acuminata.—Culp and his associates used podophyllin in the treatment of 100 young men with condylomata acuminata in the genitourinary section of the station hospital of Camp Bowie, Texas. Three of the patients also had chancres and 1 had acute gonococic urethritis, which did not complicate or prolong the condylomata treatment. The remaining patients did not have venereal disease. All but 7 patients were treated as outpatients while on full field duty. The lesions were confined to the penis,

perineum and anal area. Twelve patients had been treated by other methods (6 with acid solution of mercuric nitrate, 6 with electrofulguration) without complete disappearance of the growths or with early recurrences. In 62 cases treatment consisted of topical applications of 25 per cent podophyllin in liquid petrolatum with a cotton swab. This is prepared by suspending the crude podophyllin in liquid petrolatum and shaking well before each administration. No discomfort was experienced during the application and no anesthesia was required. Only 6 patients required more than one treatment. Most patients were cured within two to three days. The condylomas quickly turned white and dropped off, leaving a smooth, non-ulcerated base with no gross scarring. Only 2 recurrences have been reported from this group. The two responded promptly to the same type of therapy. In 35 cases the podophyllin was applied in a paste prepared by mixing the crude powder with water until the desired consistency was obtained. The drug appears to be equally efficacious when employed in this form and may be kept more localized. Only 2 patients required more than one application of the paste. The surrounding normal tissue usually is unaffected by the drug, but in isolated cases of extensive application under a tight prepuces some balanitis may result. Occasionally circumcision will be advisable because of the chemical balanitis and secondary preputial edema, but disappearance of the condylomas simplifies the surgical procedure.

Medical Annals of District of Columbia, Washington

13:213-250 (June) 1944

- Treatment of War Wounds. F. R. Moore.—p. 213.
Clinician Looks at Present Day Treatment of Malaria. H. F. Dowling.—p. 217.
Surgical Aspects of Management of Tetanus: Report of Case. F. G. Burke.—p. 221.
Two Cases of Constrictive Pericarditis. W. M. Yater and H. L. Hirsh.—p. 223.

13:251-284 (July) 1944

- Therapy of Burns. P. A. Caulfield.—p. 251.
Comparative Study of Action of Globulin Insulin with Other Forms of Insulin. M. Protas.—p. 254.
Further Observations on Continuous Caudal Anesthesia. G. J. Ellis and J. B. Sheffery.—p. 258.
Pyrogenic Reaction to Use of Thiouracil for Exophthalmic Goiter: Report of Case. J. P. Kenrick and W. M. Yater.—p. 263.

Military Surgeon, Washington, D. C.

95:1-88 (July) 1944

- Diets of Explorers. V. Stefansson.—p. 1.
Cold—R. A. F.'s Other Enemy—Is Beaten. G. L. Keynes.—p. 3.
Analysis of 150 Cases of Cardiovascular Disease in World War II Veterans. A. H. Traum and Blanche B. Wilcox.—p. 5.
Meningococcus Meningitis. F. L. Price and R. A. Mayer.—p. 11.
Veterinary Service at Army Post. D. M. Campbell.—p. 15.
Army Foot Disabilities. W. H. Burnham.—p. 20.
Meningococcal Conjunctivitis: Report of 3 Cases. C. E. Bauer, E. A. Gall and C. D. Cox.—p. 24.
Treatment of Pilonidal Cysts by Excision and Primary Closure. V. L. Barker and G. H. Clark.—p. 27.
Roentgen Therapy with Army X-Ray Field Unit. E. W. Egbert.—p. 30.
*Cardiac Strain: Myocardial Infarction Without Coronary Artery Disease: Case Report. W. K. Simmons and S. A. Wolfson.—p. 33.
Treatment of War Wounds. R. M. Hardaway.—p. 37.
Relation of Medication to Treatment of Fusospirochetal Infections of Mouth. J. H. Klock.—p. 42.
Fractures of Jaws. A. M. Maris.—p. 43.
Strabismus in Army. H. D. Rosenbaum.—p. 48.
Atypical Allergic Manifestations, Their Identification and Treatment. J. A. Rudolph.—p. 52.
Acute Rhinitis and Sinusitis: Suction Displacement Treatment with Vegetable Oils. F. G. Fox.—p. 56.
New Source of Penicillin in Treatment of Chronic Gonorrhea. D. W. Atcheson.—p. 58.
New Suture for Use in Muscle Recession Operations. C. B. Foster.—p. 62.

Myocardial Infarction Without Coronary Artery Disease.—Simmons and Wolfson report that a man aged 31 was hospitalized because of substernal pain which radiated to the left shoulder and down the inner aspect of the arm to the third and fourth fingers. He had been free of complaints up to the day of illness. Immediately after the noon meal he attempted to climb a sharply graded mountain approximately 1,600 feet in height. About one third of the way up he experienced some nausea and stopped to rest. After a brief period he continued

climbing but soon felt a substernal fullness as though 'gas was crowding his heart.' He rested a second time and proceeded to climb. About two thirds of the way up he experienced a substernal ache. He rested a third time and climbed more. A few minutes later the pain became severe and radiated to the left shoulder and down the inner aspect of the left arm to the third and fourth fingers. This time the pain persisted in spite of rest. The patient was taken by litter and ambulance to the hospital. During hospitalization he continued to have mild substernal distress and numbness and tingling of the left arm in decreasing intensity through the fourth day. The patient was at bed rest for three weeks, was then allowed up for a short interval at a time in a wheel chair and was gradually permitted restricted activity. Convalescence was uneventful. The problem of acute heart strain resulting in myocardial infarction in the absence of coronary artery disease is still a controversial subject. Parsonnet and Bernstein concluded that acute heart strain occurs in the healthy as well as the diseased heart, reasoning that the man who is working at full capacity, and who then adds a little more to this exertion, may suddenly find himself with an inadequate blood supply to a portion of his myocardium, with resultant changes identical in every respect to those seen after a coronary occlusion or thrombosis. The sequence and progress of events in the case here reported make such an occurrence likely. The authors consider it probable that other such cases will be observed with greater frequency as more men are inducted into the service and participate in physical exertion foreign to them in civilian life.

Nebraska State Medical Journal, Lincoln

29:201-232 (July) 1944

- Thrombosis and Embolism of Larger Arteries. F. M. Conlin.—p. 204.
Medical Treatment of Peripheral Vascular Diseases. R. L. Traynor.—p. 208.
Vasomotor Neuroses. A. E. Bennett.—p. 211.
Surgical Aspects of Treatment of Peripheral Vascular Disease. F. C. Hill.—p. 215.
Refrigeration Treatment of Peripheral Vascular Diseases. R. L. Egan.—p. 217.
Diseases of Peripheral Vessels. F. L. Dunn.—p. 219.
Penicillin—Indications, Contraindications, Mode of Administration and Dosage. C. S. Keefer.—p. 222.

New England Journal of Medicine, Boston

231:1-34 (July 6) 1944

- Subacute Degeneration of Brain in Pernicious Anemia. R. D. Adams and C. S. Kubik.—p. 1.
Part Time Protective Environment and Working Parole as Adjuvant in Treatment of Alcoholism. J. Thimann.—p. 9.
Epidemic Keratoconjunctivitis: Report of Case with Marked Systemic Manifestations. J. J. Curry and F. C. Lowell.—p. 11.
Physiologic Significance of Vitamin C in Man. M. Pijoan and E. L. Lozner.—p. 14.
231:35-70 (July 13) 1944
Hodgkin's Disease: II. Pathology. H. Jackson Jr. and F. Parker Jr.—p. 35.
*Pemphigus: Further Report on Chemical Studies of Blood Serum and Treatment with Adrenocortical Extract, Dihydrotachysterol or Vitamin D. W. F. Lever and J. H. Talbott.—p. 44.
Diseases of Veins. J. Homans.—p. 51.

Treatment of Pemphigus.—In two recent communications Lever and Talbott reported that significant changes in the electrolyte content of the blood serum occur in patients with pemphigus vulgaris. In an attempt to correct the chemical changes, they have treated patients with pemphigus vulgaris with adrenal cortex extract, dihydrotachysterol or massive doses of vitamin D. In the two previous publications observations on 15 patients with pemphigus were reported; since then an additional 17 patients have been studied. The authors report chemical findings in the blood serum of these patients and evaluate the effectiveness of adrenal cortex extract, dihydrotachysterol and massive doses of vitamin D. They recognize six types: pemphigus vulgaris acutus (Brocq's pemphigus subaigu malin), pemphigus vegetans, pemphigus vulgaris chronicus, pemphigus foliaceus, pemphigus erythematous (Sencar-Usher type of pemphigus) and pemphigus conjunctivae. In pemphigus vulgaris acutus, pemphigus vegetans and pemphigus vulgaris chronicus the amount of sodium, chloride, calcium and protein in the blood serum was found to be reduced. These changes were more pronounced in pemphigus vulgaris acutus and pem-

phigus vegetans than in pemphigus vulgaris chronicus. The degree of reduction usually corresponded to the severity of the clinical condition and the amount of skin involved. No etiologic significance can be attached to the chemical changes. They are regarded as a secondary symptom produced by the disease. Thirty-two patients with pemphigus were treated with adrenal cortex extract, dihydrotachysterol or massive doses of vitamin D. Encouraging results were obtained in several cases of pemphigus vulgaris acutus, pemphigus vegetans and pemphigus vulgaris chronicus. The results of treatment in cases of pemphigus foliaceus, pemphigus erythematous and pemphigus conjunctivae were disappointing. The treatment tends to correct the reduction of sodium, chloride, calcium and protein encountered in such patients. Since it is believed that the chemical changes are secondary symptoms produced by the disease, the treatment is merely symptomatic.

New York State Journal of Medicine, New York

44:1391-1502 (July 1) 1944

Management of Disorders of Thyroid: II. Myxedema. Conferences on Therapy.—p. 1468.
Ringworm Infection of Scalp in Harlem Area: Discussion of Present Inadequate Methods of Control. G. A. Spencer.—p. 1486.
Botulism: Report of Recovery After Serum. W. L. Marsden.—p. 1492.

44:1503-1614 (July 15) 1944

Nephrotosis and Nephropexy: Critical Review of 55 Cases. C. G. Bandler, B. D. Pinck and P. R. Roen.—p. 1541.
Facial Paralysis—Prosopoplegia. H. R. Merwath.—p. 1546.
Stability of Fasting Blood Sugar in Diabetes Mellitus. H. O. Mosenthal and F. U. Lauber.—p. 1555.
Cutaneous Manifestations of Tuberculosis. A. C. Cipollaro.—p. 1557.
Tissues Dose Estimation in Combined Roentgen and Radium Therapy for Carcinoma of Uterine Cervix. W. E. Howes.—p. 1563.
Role of Motivation in Psychotherapy. L. R. Wolberg.—p. 1569.
Abuse of Vasoconstrictors in Hay Fever and Vasomotor Rhinitis. L. Sternberg.—p. 1573.

Oklahoma State Medical Assn. Jour., Oklahoma City

37:239-284 (June) 1944

Acute Surgical Abdomen. V. C. Tisdal.—p. 239.
Common Orthopedic Conditions in Childhood. D. H. O'Donoghue.—p. 242.
Intramedullary Transfusions in Infants. C. M. Bielstein.—p. 243.

37:285-338 (July) 1944

*Restoration of Breathing in Emergencies and Maintenance of Respiration in Nonbreathing Patients. C. K. Drinker.—p. 285.
Trends in Public Health. H. S. Mustard.—p. 293.
Chronic Digestive Disturbance in Elderly Patient. D. D. Paulus.—p. 297.

Restoration of Breathing.—Drinker says that if artificial respiration is applied at the time at which breathing stops, chances of recovery are 100 per cent. From the second to the sixth minute the chances decrease abruptly, and from the sixth to the twelfth minute the chances of regaining breathing are possible but slight. Large numbers of people requiring instant application of artificial respiration are treated first by laymen. The prone pressure method of artificial respiration, described by Schafer in 1903, is the best for lay use. The face down position, coupled with the pressure used, provides more certain and better drainage of the air passages than is possible for the layman provided with any sort of mechanical device. In the Silvester method, in which the chest is stretched into fullest possible passive expansion by bringing the arms into full extension above the head, the patient is served more by the inherent elasticity of all the tissues and less by muscle tone. The physiologic soundness of the Silvester method is, however, negated by the position of the patient on his back, which does not favor drainage from the mouth and throat, and even more by the fact that the inspiratory expansion of the chest attained by arm extension may be too slight to provide an adequate minute volume. However, for a person with an open wound of the abdomen or for a woman in the last stages of pregnancy the Silvester method may have to be used. The author describes the discovery and mode of action of the tilting method of Eve. He regards the Bragg-Paul pulsator as the best of the many methods which operate by mechanical imitation of the prone pressure method. Occasional successes and mechanical attractiveness of the blow and suck machines do not overbalance physiologic unsuitability. The value of oxygen and carbon

dioxide in stimulating breathing is evaluated. When the respirator was first introduced, it seemed as if a way had been opened for saving almost all the victims of acute poliomyelitis. This has not proved to be true, and if the first patient had had bulbar poliomyelitis instead of a spinal type ideal for treatment, enthusiasm for the respirator would have been less. The respirator will always save the lives of some patients. There are a larger number it will not save. The Cuirass type respirators give the patient freedom and they make nursing care far less difficult, but they do not work well unless some ability to breathe is retained. The respirator enclosing the entire body is capable of giving good ventilation in the presence of complete respiratory paralysis.

Radiology, Syracuse, N. Y.

43:1-106 (July) 1944

*Clinical and Radiologic Studies of Pulmonary Mycosis. W. A. Johnston and J. Heydemann.—p. 1.
Fungus Disease of Chest. V. L. Peterson.—p. 14.
Roentgen Therapy of Sinusitis, with Special Adapter. F. C. Christensen.—p. 21.
Relation of Coincident Anomalies of Gastrointestinal Tract and Renal Ptosis to Digestive Disturbance. W. E. Reiley.—p. 30.
Diagnosis and Treatment of Osteoclastoma. J. F. Brailsford.—p. 35.
Lung Abscess Secondary to Stenosing Bronchiogenic Carcinoma. E. Kraft.—p. 39.
*March Fracture, Including Others Than Those of Foot. G. D. Carlson and R. F. Wertz.—p. 48.
Influence of Irradiation of Ovaries on Estrus and Neoplastic Development in Marsh Buffalo Mice. F. Bischoff, H. J. Ullmann and Louise P. Ingraham.—p. 55.

Clinical and Radiologic Studies of Pulmonary Mycosis.

—Johnston and Heydemann report several cases of mycotic infection encountered in a period of eight months. They stress that classification of yeast infections is a difficult procedure. Literature dealing with mycotic infections of the lung demonstrates little, if any, difference between the history, physical findings, pathology and sequelae of the various types of yeast infection. The reported cases demonstrate some of the difficulties encountered in evaluating the importance of yeast in the sputum. There may be a pure infection; there may be a secondary infection which assumes a primary role; the yeast may be an incidental finding of no clinical significance; it may be a contaminant from a receptacle. The authors feel that yeast infections are much more prevalent than ordinarily thought. As proved in the literature and in the cases reported, too many mycotic infections go unrecognized until shortly before a terminal condition exists. The recognition of mycotic infections of the lungs is in great part the responsibility of the roentgenologist. He must stimulate further study to eliminate or prove the presence of a mycotic infection.

March Fracture.—Carlson and Wertz point out that, although march fracture shows the highest incidence in the foot, it is occasionally encountered in other bones. Their report is based on 70 cases referred to the roentgenologic service of Brooke General Hospital, Fort Sam Houston, Texas, from January 1942 to April 1943, comprising 66 involving the metatarsals, 3 the femur and 1 the os calcis. Practically all cases presented varying degrees of periosteal reaction, while only 31 showed definite fracture lines. The greatest amount of callus appeared from one to two months after the onset of symptoms. Of the 66 men with metatarsal fractures, only 5 were placed on limited duty. Of the remaining 61, 11 received treatment in the outpatient clinic, consisting chiefly of arch supports, proper fitting of shoes and return to full duty. The other 50 patients were hospitalized, treatment consisting in the application of a plaster walking boot for an average of three weeks, followed by ten to fourteen days of physical therapy and proper arch supports. All 50 returned to full duty. All 3 femoral fractures involved the distal portion of the shaft with no displacement. One man returned to full duty and 2 were placed on limited duty. The patient with an os calcis fracture was likewise placed on limited duty. A diagnosis of march fracture may be made in many cases on the basis of periosteal proliferation, even in the absence of a fracture line. This condition is an example of pseudofracture. The all important factor in diagnosis is to avoid a mistaken interpretation of malignant bone tumor, leading to amputation or other unnecessary radical therapy.

Surgery, Gynecology and Obstetrics, Chicago

79:1-112 (July) 1944

- Definition of Objectives and Importance of Controls in Evaluating Local Use of Sulfonamides in Wounds. J. S. Lockwood.—p. 1.
- Thyroid Function as Factor in Gallbladder Disease and Formation of Gallstones: Clinical and Experimental Study.—p. 10.
- Presacral Neurectomy for Intractable Vesical Pain and Neurogenic Vesical Dysfunction. C. E. Jacobson, W. F. Braasch and J. G. Love.—p. 21.
- Some Complications in Surgical Handling of Carcinoma of Left Colon and Rectum. H. C. Saltzstein and J. Kelly.—p. 27.
- *Ligation of Thoracic Duct and Posthemorrhage Plasma Protein Level. Co Tui, I. S. Barcham and B. G. P. Shafroff.—p. 37.
- Local Effect of Tropic Anesthetic Drugs on Motility of Gastrointestinal Tract of Human and Dog. N. Crohn, W. H. Olson and H. Necheles.—p. 41.
- *Relation of Vitamin C to Anesthesia. K. H. Beyer, J. W. Stutzman and B. Hafford.—p. 49.
- Reconstruction of Common Bile Duct. J. Walton.—p. 57.
- *Deep Quiet Venous Thrombosis in Lower Limb: Preferred Levels for Interruption of Veins; Iliac Sector or Ligation. J. Homans.—p. 70.
- *Canavalin, New Enzymatic Bactericidal Agent: Preliminary Report. D. L. Farley.—p. 83.
- Helmet for Protection Against Craniocerebral Injuries. L. Davis.—p. 89.
- Surgery of Pelvic Colon and Rectum. J. W. Baker.—p. 92.
- Experimental and Clinical Study on Use of Adult Animal Tissue Extract in Acceleration of Wound Healing: Preliminary Report. R. S. Hoffman and J. A. Dingwall.—p. 103.

Ligation of Thoracic Duct and Posthemorrhage Plasma Protein Level.—Co Tui and his associates reported in a previous communication that after hemorrhage the concentration of proteins in the thoracic duct lymph undergoes a considerable increase. It was suggested that the lymph serves an important role in the compensatory mechanism of hemorrhage, not only as a pathway for fluid, but also as a source of protein replacement. The present work is an attempt to assay the role of the thoracic duct, the principal lymph collecting channel, in the maintenance of the plasma protein level after acute hemorrhage. The posthemorrhage hematocrit and plasma protein values were determined in two groups of dogs, one with the thoracic duct ligated and the other with the thoracic duct intact. In the group with the intact thoracic duct the prehemorrhage level of plasma proteins was achieved in from twenty-four to forty-eight hours. In the group with the thoracic duct ligated this level was not reached until after eight days. On the basis of this finding and on the basis of the finding previously reported of increase in protein concentration in thoracic duct lymph following hemorrhage, it is postulated that the thoracic duct and, therefore, the lymphatic system is an important pathway not only for the return of proteins from the capillary filtrate to the blood but also for the mobilization of proteins from protein depots in the body.

Relation of Vitamin C to Anesthesia.—Beyer and his associates aimed to determine (1) the effect of anesthesia on the vitamin C content of plasma and (2) the effect of C avitaminosis on the animal's response to anesthetic agents. The anesthetics used were diethyl ether, vinethene, chloroform and cyclopropane. The first three agents were given by the "open drop" technic to 8, 6 and 12 dogs respectively. The animals used for the "open drop" anesthetizations were not intubated. None of the animals were given premedication. All the dogs were maintained at light surgical anesthesia for forty-five minutes. Six dogs were anesthetized by rebreathing a cyclopropane-oxygen mixture from a 5 liter rubber bag. Closed system anesthesia with diethyl ether was employed for 12 dogs. Guinea pigs were used to study the effect of the vitamin C content of an animal on its response to anesthesia. During and at least for the first seven hours following a forty-five minute period of anesthesia the dog plasma ascorbic acid level increased noticeably. Subsequently the plasma level fell within twenty-four hours to below the preinduction control levels. These observations held for cyclopropane, ether, vinethene and chloroform independently of the mode of anesthetization. This effect was due to the anesthetic agent and not to an inadequate oxygen intake, which tended only to reduce the rate and extent of the mobilization and to decrease or abolish the twenty-four hour fall in plasma ascorbic acid level. The initial mobilization and secondary depletion of plasma ascorbic acid which the authors observed fits in with the results of others. It is apparent that ascorbic acid is readily released from some source under the influence of anesthesia, but there is no explanation as to how

it is contained in or released by tissues. While inadequate tissue oxygenation is not responsible for the mobilization or depletion of the plasma vitamin C level, it does somehow quantitatively influence the extent of these phenomena, tending to diminish both fluctuations. Vitamin C deficiency caused guinea pigs to be more quickly inducted into anesthesia and more profoundly depressed by a given concentration of ether, chloroform or vinethene. The vitamin C deficient animals recovered slowly, if at all, from a duration of anesthesia which had little apparent after-effect on guinea pigs that had received the same scorbutogenic diet but which were injected with 30 mg. of ascorbic acid daily.

Deep Quiet Venous Thrombosis in Lower Limb.—Thrombosis of a quiet type (phlebothrombosis) commencing in the deep veins below the knee is the source of most nonobstructive processes threatening pulmonary embolism as well as most obstructive inflammatory ones responsible for painful swelling of the whole lower limb (thrombophlebitis). Thrombophlebitis of the fully obstructive type presents no indication for operations but rather for release of the associated vasoconstriction by lumbar sympathetic block. It is desirable and usually possible to distinguish an early stage of quiet, deep venous thrombosis when the process is still confined to the lower leg or has given rise to an unattached propagating thrombus in the popliteal and femoral veins, threatening pulmonary embolism. An advanced stage of quiet, deep venous thrombosis, more or less adherent but not obstructive, can also be distinguished. Thrombosis will often have propagated above the inguinal ligament into the external and, occasionally, especially on the left, the common iliac vein. With such a process, thrombosis of the deep veins among the muscles of the thigh (profunda femoris system) is usually associated. Thrombosis in these deep veins may even be present when no thrombus is found on exploration of the superficial femoral vein below the profunda. Though interruption of the common femoral vein offers a considerable degree of protection against subsequent serious pulmonary embolism, it cannot give the assurance of a yet higher division, for example, in the common iliac vein. If the common iliac vein is divided, blood can escape via the common femoral through the deep epigastric, the deep circumflex iliac and particularly through the hypogastric vein. It may pass by way of this last channel through rectal vessels into the inferior mesenteric vein or to the opposite side of the pelvis, and in women an additional collateral field is offered by the uterine and ovarian veins. Clinical experience indicates that while serious venous congestion and swelling sometimes follow interruption of the common femoral vein when the superficial and deep femoral systems are partly filled with adherent thrombus, section or ligation of the common iliac vein seems to leave no such troubles behind. Homans presents observations on interruption of the vena cava. This operation is probably indicated in the presence of bilateral thrombosis, which is believed to have arisen in the main venous stem, on both sides, to or about the level of the inguinal ligaments. It is to be preferred to separate ligation of each common iliac vein.

Canavalin, New Enzymatic Bactericidal Agent.—Farley directs attention to his discovery of a new enzymatic bactericidal agent called canavalin. He describes the method of its preparation, experimental data showing its in vitro action and certain preliminary information as to its clinical use for patients. Canavalin is a mixture of an enzyme and a co-enzyme solution separately extracted and mixed. The enzyme portion is an extract of jack bean (*Canavalia ensiformis*—8). It also has been extracted from soy beans, liver and white potatoes. The jack bean is the best source. The co-enzyme portion of canavalin is associated with the vitamins of the water soluble B group. Thiamine and riboflavin are used to produce in vitro a supply of co-enzyme. This co-enzyme is called "vitatropin" and has the physical characteristics usually possessed by a co-enzyme—thermostability, filtrability and the property of being precipitated from a watery solution by an organic solvent. Both enzyme and co-enzyme have been found by the author to be present in normal blood. In vitro studies revealed that canavalin renders both gram positive and gram negative organisms incapable of growth. The author reports 13 cases of *Ishtar* pneumococcal pneumonia treated with canavalin. Every case showed a definite drop in temperature.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Australian and New Zealand J. Surgery, Sydney

13:219-280 (April) 1944

- Dangers and Complications in Treatment of Hemorrhoids. T. H. Ackland.—p. 219.
New Techniques and Old Principles. W. B. Parsons.—p. 232.
Traumatic Lesions of Large Blood Vessels Treated in Prison Camp in Germany. B. Moore.—p. 241.
*Acetylcholine Synthesis and Myasthenia Gravis. E. R. Trethewie and R. D. Wright.—p. 244.
Physiotherapy in Chest Surgery. J. I. Hayward.—p. 247.

Acetylcholine Synthesis and Myasthenia Gravis.—Trethewie and Wright investigated the effect of thymic extract on the synthesis of acetylcholine. An increase in acetylcholine synthesis was detected when "normal" thymus was added to brain extracts. A decrease in acetylcholine synthesis was observed when thymus from a severe case of myasthenia gravis was added to brain extract. Three likely explanations of the deficiency in myasthenia gravis are suggested: excess destruction of acetylcholine by esterase, defective utilization of acetylcholine and defective synthesis of acetylcholine. The authors present evidence in support of the rationale of the removal of the thymus in myasthenia gravis.

Brain, London

67:1-68 (March) 1944

- Pyramidal Section in Cat. E. G. T. Liddell and C. G. Phillips.—p. 1.
Nature of Transient Outbursts in Electroencephalogram of Epileptics. D. Williams.—p. 10.
Form of Familial Presenile Dementia with Spastic Paralysis. C. Worster-Drought, J. G. Greenfield and W. H. McMenemey.—p. 38.
Meralgia Paresthetica Due to Nodular Lipomatosis and to Traumatic Lesions in Thigh: Reflex Theory of Sensory Neuritis. M. Kelly.—p. 44.
Recovery of Spatial Orientation in Post-Traumatic Confusional State. A. Paterson and O. L. Zangwill.—p. 54.

British Journal of Industrial Medicine, London

1:81-144 (April) 1944

- Training of Industrial Nurse. A. J. Amor and Clare Sykes.—p. 81.
Design of Dressing Stations and Control of Wound Infection. W. Gissane, A. A. Miles and R. E. O. Williams.—p. 90.
First Aid Treatment of Burns and Scalds. L. Colebrook, T. Gibson and J. P. Todd.—p. 99.
Burns of Hand. P. H. Jayes.—p. 106.
Prevention and Control of Cutting Oil Dermatitis. E. Collier.—p. 110.
New Aspects of Nutrition. J. R. Marrack.—p. 114.
Medical Service in Industry in U. S. S. R. A. Letavet.—p. 123.

British Journal of Ophthalmology, London

28:261-316 (June) 1944

- Eye Department in Middle East General Hospital. H. B. Stallard.—p. 261.
Simple Method for Early Diagnosis of Abnormalities of Pupillary Reaction. H. J. Stern.—p. 275.
Granulation Tumor of Conjunctiva. J. D. J. Freeman.—p. 277.
*Genetics of Retinoblastoma. A. D. Griffith and A. Sorsby.—p. 279.
Encapsulated Orbital Melanoma. J. Foster.—p. 293.
Removal of Nonmagnetic Foreign Body from Vitreous. V. O'Hea-Cussen.—p. 296.

Genetics of Retinoblastoma.—According to Griffith and Sorsby retinoblastoma is a rare tumor. They say that at the Royal Eye Hospital, London, there were seen 59 children with retinoblastoma during the fifty years 1894-1943, and among these there was only one familial group. The pedigree of this familial group has been reported in part on previous occasions, but it is now possible to extend and amplify the previous observations of retinoblastoma in two generations to the observed occurrence of this condition in a member of the third generation. Following brief histories of the 6 affected members of this familial group the author stresses the early age at which the tumors occurred and the great tendency to bilateral involvement in this family. In only 1 of the 6 patients has the lesion been unilateral. After reviewing observations on sporadic retinoblastoma in which the incidence of bilateral involvement is much lower, the authors cite reports from the literature on retinoblastoma in sibs with clear antecedents. These reports

show that the mode of inheritance is irregularly dominant. The authors suggest that it is possible that hereditary retinoblastoma is a distinct histologic entity different from the sporadic types.

British Medical Journal, London

1:773-802 (June 10) 1944

- Analysis of Shock. V. H. Moon.—p. 773.
Meningitis Due to Pittman and Non-Pittman Strains of *H. Influenzae*. J. Gordon, H. E. de C. Woodcock and K. Zinnemann.—p. 779.
Sulfonamide Allergy. R. G. Park.—p. 781.
Treatment of Pulp Infection of Fingers in the Field. T. Denness.—p. 782.
Early Operation for Volkmann's Ischemic Contracture. G. A. Pollock.—p. 783.

1:803-832 (June 17) 1944

- *Control of Scabies by Use of Soap Impregnated with Tetra-Ethylthiuram Monosulfide ("Tetmosol"). R. M. Gordon, T. H. Davey, K. Unsworth, F. F. Hellier, S. C. Parry and J. R. B. Alexander.—p. 803.
*Carrier State in Sonne Dysentery. J. G. Hailwood.—p. 806.
Analysis of Colles's Fracture. S. C. Rogers.—p. 807.
Outbreak of Puerperal Sepsis Due to Single Type of Hemolytic *Streptococcus*: Its Investigation and Remedy. M. Kenny and Mary Barber.—p. 809.
*Narcoanalysis with Nitrous Oxide. C. H. Rogerson.—p. 811.

Control of Scabies by Soap Impregnated with Tetra-Ethylthiuram Monosulfide.—Gordon and his associates show that tetraethylthiuram monosulfide ("Tetmosol") when combined with soap in 5, 10 and 20 per cent dilutions retains its sarcopticidal properties. In rat scabies due to *Notoedres*, tetmosol soap produced a local therapeutic effect when used daily or weekly, the local infection being cured in some cases, the mite population being reduced in others. Six men suffering from *Sarcoptes scabiei* infection received five to six baths with 20 per cent tetmosol soap on successive days; all were cured. A further series of 110 men received three baths with 20 per cent tetmosol soap over a period of a week. All remained under observation for at least six weeks, at the end of which period 88 were found to have been cured and 22 to have relapsed. Although it has been shown that the repeated use of tetmosol soap cures a high proportion (80 per cent) of cases of scabies, the soap is unlikely to supersede any of the standard methods employed which result in more than 90 per cent cures. On the other hand, the simplicity of supplying a tablet of soap and instructing the patient to use it when bathing suggests the possible value of the soap in communities which have become disorganized as a result of war and in which it is not practicable to employ standard methods of treatment. Generalized use, however, will be possible only if dermatitis does not follow prolonged use of the soap. The authors have shown that the incidence of dermatitis following the use of the soap for short periods is low, and that it was low also among a small number of people tested over a prolonged period; but no estimate can be made of the risk of dermatitis until an extensive trial with a large number of individuals has been carried out.

Carrier State in Sonne Dysentery.—The severe outbreak of dysentery described by Hailwood occurred in an artillery regiment in July and August 1943. At least 1 Sonne positive case was found among the personnel in each cook house, but only 1 man was found whose history of diarrhea was outside the limits of the incubation period. In August 1942 he had been admitted to a camp reception station with acute enteritis, pyrexia, colic and frequent stools containing blood and mucus. In November 1942 he was posted to this regiment and in February 1943 was employed in the sergeants' quarters. His duties included providing the sergeants with cups of tea, bread and butter, and so on. At this period there was a mild outbreak of enteritis in the regiment, 80 cases in all, of which the majority were sergeants. For some months he was then employed on the guns, but on July 7 he was detailed for duty as orderly in one of the regimental cook houses. His job was mainly cutting bread and butter. The first cases occurred about July 20 and were among the battery personnel served from this particular cook house. It is certain that in the course of his duties this man visited the other regimental cook houses on numerous occasions, and thus infection would be conveyed to food and personnel in them, with consequent spread of the epidemic to the remaining two batteries. He did not so visit the permanent staff cook house, and no cases occurred among

the personnel served from there. This man had had no symptoms since his moderately severe attack twelve months previously, but his stool showed a heavy infection of *Bacterium sonnei*. The removal of all infected cooks from the cook house immediately stopped the outbreak. The opinion is put forward that the so-called symptomless carrier of *Sonne dysentery* is common but that a history of diarrhea at some time in the past can usually be obtained.

Narcoanalysis with Nitrous Oxide.—Rogerson cites disadvantages of narcoanalysis by means of barbiturates and says that during the past twelve months a way has been found of overcoming these objections by the substitution of inhaled nitrous oxide for intravenous barbiturates as the anesthetic agent. The Minnitt obstetric gas-air analgesia apparatus proved ideal. The flow of gas is regulated by the patient's breathing, so that there is no waste. The patient himself controls his intake of gas and can stop at any moment; fear is thus almost entirely eliminated. During the whole of the induction period gentle suggestions are given that he is becoming relaxed, that painful ideas will come more readily to his mind and that his thoughts are flowing easily and without restraint. As soon as he drops the mask he is urged to express whatever comes into his mind. In the case of a hysterical fugue he is told that he will relive the forgotten incidents. The author used this method with a considerable number of patients and reports 2 representative cases. He thinks that other methods of narcoanalysis could not have achieved similar results without a far greater expenditure of time. The availability of narcosis "on tap" in the consulting room, ready to be used at any moment in the course of analysis, is a great advantage. Patients themselves express a strong preference for the nitrous oxide technic; when the two have been used in a single case, access to hidden mental conflicts is fully as effective with gas as it is with a barbiturate.

Edinburgh Medical Journal

51:161-208 (April) 1944

- Intersigmoid Hernia: Report of Case and Review of Literature. H. D. Wilson.—p. 161.
Military Surgery in Geographic Perspective: Libyan Exercise in Surgical Strategy and Tactics. I. Aird.—p. 166.
Etiology, Prophylaxis and Treatment of Cholecystitis and Cholelithiasis. L. S. P. Davidson.—p. 184.
Acute Schizophrenia in Childhood: Report of Case. Louise F. W. Eickhoff.—p. 201.

Lancet, London

1:745-776 (June 10) 1944

- *Management of Minimal Pulmonary Tuberculosis Disclosed by Fluorography. W. D. W. Brooks.—p. 745.
Comminuted Fractures of Mandible: Report on 25 Consecutive Cases from Plastic and Jaw Unit. J. B. Cuthbert.—p. 748.
Human Factor in Military Malaria Control. R. R. Bomford.—p. 750.
Angular Conjunctivitis Treated with Propamidine. F. C. O. Valentine and A. M. Edwards.—p. 753.
Ankylosing Spondylitis. E. Fletcher.—p. 754.
Facial Palsy in Closed Head Injuries, with Prognosis. J. W. A. Turner.—p. 756.
Pyroelectric Shock Therapy in Schizophrenia. J. Fuster.—p. 757.
Adsorption of Acridines by Gauze. A. Albert and W. S. Gledhill.—p. 759.

Tuberculosis Disclosed by Fluorography.—Brooks says that fluorography has made possible diagnosis of pulmonary tuberculosis on a scale far transcending anything previously achieved among the apparently healthy, and the yield of cases with minimal disease is considerable. Fluorography of 479,373 apparently healthy male personnel of the Royal Navy showed that 6,077 (12.7 per thousand) had radiologic signs of adult type pulmonary tuberculosis. In 47.9 per cent of these the lesion was "minimal." Of 23,344 of the female personnel 213 (9.1 per thousand) had similar evidence of tuberculosis, and the lesion was minimal in 55.4 per cent of these. Similar investigations among civilians will no doubt bring to light large numbers of cases of pulmonary tuberculosis of this slight degree, raising difficult problems of disposal and treatment. In some of these minimal cases the disease is arrested or is retrogressive, but in others it is progressive. Careful study is needed to decide whether the infection is active, and investigation in a hospital is essential. When 2,911 sailors with minimal lesions were first studied in a hospital 16 per cent showed evidence of active infection, while in 63 per cent the disease appeared to be inac-

tive but the stability of the lesions was doubtful. In 21 per cent the disease was arrested. Naval personnel with apparently inactive minimal tuberculosis have been placed on light shore duties and kept under observation. Study of these cases shows that the younger the patient the more likely the disease is to become active and the relapse to be serious. Observations indicate that a diagnosis of apparently inactive minimal tuberculosis in males under 50 should imply outpatient supervision, together with regular inpatient reexamination during the next two years. For patients under 30 this observation should probably last longer. Supervision should be combined with appropriate modifications in the patient's mode of life.

Medical Journal of Australia, Sydney

1:453-476 (May 20) 1944

- *Eosinophilia in Tropical Disease: Experiences at an Australian General Hospital. T. E. Lowe.—p. 453.
*Complement Fixation Tests in Meningococcal Infections. J. M. Bonnin.—p. 456.
Fee Principle and Medical Organization. A. E. Brown.—p. 460.

Eosinophilia in Tropical Disease.—Lowe and his colleagues studied the blood picture of men returned from service in tropical areas. Most suffered from more than one tropical illness; combinations of malaria and helminth infections were frequent. Observations were made on the effects of tropical diseases on the eosinophil picture. For comparison the eosinophil counts of normal subjects were obtained. The average reading of the eosinophil count in the control group was 145 per cubic millimeter and the range was from 0 to 700 per cubic millimeter. In 100 patients convalescent from malarial attacks the range of the eosinophil counts was between 0 and 1,350, with an average of 250 per cubic millimeter. Observations in additional selected cases suggest that the upper limit of eosinophilia in these cases may be of the order of 1,750 cells per cubic millimeter. Eosinophilia diminished as time progressed but lasted for at least eight weeks. A pronounced fall by some 50 per cent in the number of circulating eosinophil cells occurs twenty-four to thirty-six hours before the onset of malarial symptoms. After the febrile period, in cases in which treatment is given, the eosinophil cell count rises and regains its previous level in about ten days. In hookworm infection the eosinophilia was due to the presence of adult worms in the intestinal canal. It reached an average figure of 1,800 cells per cubic millimeter. After effective treatment, in two thirds of the cases the eosinophilia has disappeared within four weeks, but in the remaining one third it has persisted for much longer periods. Malaria convalescents with *Trichocephalus* infection revealed a range of eosinophil cell counts between 240 and 1,700 cells per cubic millimeter. Although the average of these figures is higher than that for subjects convalescent from malaria, it is within the range of postmalarial eosinophilia, so that *Trichocephalus* cannot be considered as a frequent cause of significant eosinophilia. The patients with *Strongyloides stercoralis* infection all had pronounced eosinophilia, but they either had coexisting infection with other helminths or were convalescent from malaria. However, the eosinophil cell count did not fall during the weeks of observation, as would have been expected if the postmalarial phase was contributing greatly to the condition. Cases of infection with *Ascaris lumbricoides* are associated with eosinophil cell counts of the same order as those accompanying *Strongyloides* infection. Under the heading of unexplained eosinophilia the authors say that 14 patients convalescent from malaria have shown a persistent eosinophilia for which no adequate explanation can be offered. They think that in malaria and in the helminth infections studied two different factors are concerned with the production of eosinophilia: (a) a nonspecific factor similar to that present in bacterial infections and (b) a specific factor due to helminth infection.

Complement Fixation Tests in Meningococcal Infections.—Bonnin shows that a close morphologic cultural and serologic relationship exists between meningococci and gonococci. It is known that a positive response to the gonococcus complement fixation test may be obtained in cases of meningococcal meningitis. The object of this investigation was to determine whether this test would be of use in the diagnosis of obscure meningococcal infections. The gonococcus complement

fixation test and the meningococcus complement fixation test were made in cases of meningitis, and control tests were performed with the serum of 58 subjects all of whom denied having had gonorrhea in the past. The gonococcus complement fixation test was found to produce a positive result in some cases of meningococcal infection. It also produced a positive response in 2 of 57 control cases. Thus it should not be regarded as absolute evidence of gonococcal infection. The meningococcus complement fixation test performed with two varieties of antigen was found to be too open to false positive results to be of any diagnostic value. The gonococcus complement fixation test may be used as an aid to diagnosis in obscure cases of meningococcal septicemia. The result should be interpreted in association with the clinical picture. The gonococcus complement fixation test may show that chronic meningococcal septicemia presenting in other than the well recognized form is more common than is generally realized. Though it cannot be used as the sole diagnostic criterion, it may be used as an indication for chemotherapy.

Ophthalmologica, Basel

104:289-348 (Dec.) 1942

- Arteriosclerotic Atrophy of Optic Nerve. K. T. A. Halbertsma.—p. 289.
Ocular Aspects of Cushing's Disease. M. Radnót.—p. 301.
*Mode of Inheritance of Choroideremia. J. Goedbloed.—p. 308.
Incomplete Glaucoma: Study of Glaucoma Without Hypertension. R. Weekers.—p. 316.

Choroideremia.—Goedbloed states that in patients with choroideremia the external examination of the eyes does not reveal anything abnormal. The media are clear. The characteristic alterations are found in the background of both eyes. With the exception of the optic disk and the region of the macula the whole fundus shows a grayish, or greenish white color which gives the impression of almost complete absence of the pigment layer of the retina and the choroid. The term choroideremia is probably a misnomer, but it is impossible to say so definitely because of the complete lack of histologic information about this rare condition, of which only 34 cases have been reported in the literature. The author discovered this condition in a man aged 38. He had the opportunity to subject to ophthalmologic examination also the patient's mother and only sister, whose fundus condition is best characterized as nonsyphilitic pepper and salt fundus. Discussing the hereditary transmission of choroideremia, the author reviews some reports from the literature, particularly the report of Schutzbach, who, in a family that could be followed for four generations, detected 3 cases of choroideremia and several cases of a fundus condition that closely resembled syphilitic pepper and salt fundus although the Wassermann test in all cases was negative. This picture was quite identical with that found in the author's female patients. He concludes that choroideremia has an intermediate gonosomal (sex linked) heredity.

Medicina, Mexico, D. F.

24:223-246 (June 25) 1944. Partial Index

- *Importance of Study of Bone Marrow, Especially of Megakaryocytes in Hemorrhagic Diseases. L. Sánchez Yllades and A. Ramírez Mendoza.—p. 223.

Bone Marrow Megakaryocytes in Hemorrhagic Diseases.—Sánchez Yllades and Ramírez Mendoza report 60 cases of hemorrhagic disease, the majority in children. Special importance is given to the number of megakaryocytes in the bone marrow and of platelets in the peripheral blood, as well as to the morphologic changes of these cells in the diagnosis of hemorrhagic diseases. The number of megakaryocytes in the bone marrow and of platelets in the peripheral blood in thrombopenic purpura (including the megakaryophthisic and panmyelophthisic forms) and also in hemorrhagic leukemia is diminished. The number of megakaryocytes is increased in megakaryocytic purpura. The megakaryocytes and the platelets show morphologic changes in both the megakaryocytic and the megakaryopenic forms of thrombopenic purpura. In the various forms of hemorrhagic diatheses and purpura which are due to disorders of blood coagulability the number of blood platelets may be normal, increased or diminished, whereas the number of megakaryocytes is either normal or increased. Diminution in the number of megakaryocytes in these forms indicates aggravation

of the hemorrhagic diathesis or of hemorrhagic purpura. The former include the avitaminotic, the allergic and the toxic and infectious types of endothelioses and telangiectatic and nervous purpura, whereas the latter include hemophilia, fibropenia and hypothyrombinemia. The estimation of the megakaryocytes is of diagnostic and therapeutic value in the types of hemorrhagic disease mentioned.

Semana Médica, Buenos Aires

51:1061-1112 (May 25) 1944. Partial Index

- *Steroid Hormones: Renotropic and Antiuremic Effect; Selye's Method. A. D'Angelo Rodríguez.—p. 1062.

Desoxycorticosterone Acetate in Uremia.—D'Angelo Rodríguez administered desoxycorticosterone acetate intramuscularly to several ambulatory patients with acute or subacute uremia. The drug was given in daily doses, which varied from 2 to 5 mg. The author found that the results were similar to those of Selye in experimental uremia: (1) The drug caused a progressive diminution of the amount of urea in the blood, (2) it proved to be harmless and effective when given in proper doses and (3) the arterial blood pressure of the patients was improved.

Chirurg, Berlin

15:249-280 (May 1) 1943. Partial Index

- *Problems of Exophthalmic Goiter. E. Ljunghusen.—p. 249.
Differential Diagnosis of Diseases of Lymphatic System in Surgery. R. Herget.—p. 254.
Question of Usefulness of Adding Colloid to Fluid Blood Substitute. A. Engelhardt.—p. 259.
Local Gigantism of Leg Resulting from Congenital Anomaly of Vessels and Its Operative Removal. K. Scherwitz.—p. 263.
Küntsch's Nailing of Fracture of Forearm. R. Maatz.—p. 278.

Problems of Exophthalmic Goiter.—Ljunghusen calls attention to the fact that cases with postoperative and spontaneous thyrotoxic crises present the same aspect: rapid pulse and rise of temperature. The typical course is that of temporary hyperfunction followed by progressive destruction of the thyroid with its biologic sequels. The concept of the absorption of thyroxine from the wound and of its predominance in the postoperative course is erroneous. The curves of pulse and of temperature of two different groups of patients were compared. One group consisted of patients on whom operation was performed for exophthalmic goiter, whereas surgical removal of a simple goiter was performed on those of the second group. In general, the simple goiter is larger than the exophthalmic goiter and the surgical exposure is greater. The thyroxine content of the wound surface is larger, and consequently a larger amount of thyroxine is likely to be absorbed. However, only a slight increase in pulse and little rise of temperature was observed after the removal of a simple goiter, whereas a fulminant, postoperative crisis with severe tachycardia and hyperpyrexia occurred in cases of exophthalmic goiter in which preoperative iodine therapy had no effect. Compensatory adrenal hyperfunction is suggested as an adequate concept of the thyrotoxic crisis. Complete recovery resulted from subtotal strumectomy in cases of tuberculosis of the thyroid as well as in cases of exophthalmic goiter. This recovery, in spite of the unbiologic crippling of the organ, is considered as a link between the two processes which have so far been considered different in origin and character. Exophthalmic goiter after severe psychic trauma should not be considered as thyrogenic thyrosis but as severe and protracted stimulation of the thyroid gland and of the adrenals from the cerebrum. Thyrotropic hormone therapy in postoperative thyrotoxic crisis is suggested because the crisis may be caused by the increased thyroxine want, which cannot be met by the silenced thyroid. By this therapy the output of the remaining part of the thyroid may be increased, provided the remaining part is not too small and is sufficiently nourished. In case the thyrotoxic gland should contain a tuberculous agent, this will be found in the interstitial tissue. The thyroid of animals experimented on should be infected by the vascular route in a study to clarify the tuberculous origin of the disease. A borderline may be demonstrated where the picture of tuberculosis may be found on one side and that of toxic diffuse goiter on the other. Roentgen therapy proved successful in cases of mild hyperthyreosis and in severe cases in which operation had been omitted. The long duration of this therapy is its greatest disadvantage.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SENSITIVITY TO ANESTHETICS

To the Editor.—Is there any acceptable test for determining whether a patient may be sensitive to procaine hydrochloride injected into the spinal canal for anesthesia?
M D, New York.

To the Editor.—While taking ether, a child aged 5, in good health except for chronically infected tonsils, broke out with a widespread urticaria. The lesions appeared shortly after the anesthetic was begun, i. e. within five minutes. No preoperative medication had been given. Within ten minutes after the injection of 3 minims (0.18 cc.) of epinephrine the urticaria disappeared. Is the reaction to be expected if the child takes ether again? Is the reaction of a serious nature?
M D, Nebraska.

ANSWER.—1. There is no generally accepted test to prove definitely that a patient will be sensitive to procaine injected into the spinal canal to produce anesthesia. However, there is a test which can be used which will indicate that the patient may be sensitive to procaine. The test is carried out as follows: The patient's back is exposed. Uncolored alcohol is used as an antiseptic and is applied gently. A 1 per cent solution of procaine hydrochloride without epinephrine is prepared. A syringe and wheel needle also are prepared. Isotonic solution of sodium chloride is similarly prepared with another syringe and wheel needle. One cubic centimeter of isotonic solution of sodium chloride is injected to form a skin wheal, and the reaction of the patient both locally and systemically is noted. After a few minutes (five) another wheal is raised with 1 cc. of the 1 per cent solution of procaine hydrochloride without epinephrine at a distance of 2 or 3 inches from the wheal raised with the salt solution. Again the patient is observed for symptoms of sensitivity either locally, systemically or both. If the patient shows no local difference between the wheals and is undisturbed by the injection, the probabilities are good that the drug may be used intraspinally without producing any further evidence of sensitivity. Conversely, if the patient shows no reaction to the wheal raised with the salt solution but does show a local reaction, particularly redness of the wheal that was raised with procaine, and if there are signs of dyspnea, apprehension and rapid pulse with or without a fall in blood pressure, it may be assumed that the patient is sensitive to procaine and that this agent should not be used as a spinal anesthetic.

There is considerable disagreement concerning the testing of patients for drug sensitivity. It is but rarely that the anesthetist observes symptoms during spinal anesthesia which he feels are due to sensitivity of the patient to procaine used intraspinally.

2. Blotching of the skin as a reaction with ether anesthesia is rather common in children. It usually is only temporary and is never serious. The probabilities are that if the child is given ether anesthesia again the same reaction will occur, but it is not a serious matter. Real urticaria from ether is unusual but is not serious, as was demonstrated in this case.

ALLERGY TO COLD

To the Editor.—A boy aged 11 has a deviated nasal septum. When exposed to the least chill, as from an electric fan, he gets a stuffiness in the nose, followed often by a cough. The chest is normal except for a few localized sibilant rales, which clear up on coughing; I have used the usual nasal drops and sprays. His condition is not seasonal, he does not have asthma. What treatment is advised? Should an operation on the septum be performed? If so at what age? Is there a chance that the septal condition will improve as the child grows older?
M D, Alabama

ANSWER.—There is reason to believe, because of the sensitivity to cold, that this patient is basically allergic even if there is no evidence of pollinosis or asthma. Septal deviations are not likely to cause the symptoms mentioned, and an operation would not be apt to help matters. Further studies should be made to prove the presence of an allergic state. Nasal smears should be examined for the presence of eosinophils; when found in number they are pathognomonic. If on examination no secretion is present, cotton plugs should be placed in the nares for a short time to excite a flow, so that a suitable smear may

be made. From the history as given, it seems unlikely that there will be found a sensitivity to food or even inhalants; the sensitivity is probably not to heat or cold per se but to the change in temperature.

Contrast baths, such as alternating hot and cold showers, are one important method of treatment. If this is considered too drastic the patient may gain tolerance by rubbing an increasing area of the body surface with ice for a few minutes daily. Some observers have obtained good results by increasing dosage of histamine injected twice daily for two weeks and once a day for another two or three weeks.

Reference:

Feinberg, Samuel M.: *Allergy in Practice*, Chicago, Year Book Publishers, 1944.

ADOPTION AND FERTILITY

To the Editor.—It is often said that a sterile married couple tends to become fertile after adopting a baby and that repeated pregnancies tend to ensue. Do the records of specialists and of clinics dealing in sterility bear out this dictum? Do they shed any light on its mechanism? For example were the mothers' menstrual and ovulatory cycles recognizably abnormal during the sterile early years of marriage, were the fathers' sperm recognizably abnormal, and the like? Do they point to indications for advising patients to adopt a baby? Hypothalamic pathways may be involved in the endocrine phenomena that have been studied in cases of so-called freshman amenorrhea, in which luteinizing gonadotropic factors of the pituitary are suspected to be inhibited. Can similar mechanisms be demonstrated in cases of some of these babyless sterile marriages?
M D, Wisconsin

ANSWER.—Statistical studies comparing the incidence of pregnancy among previously sterile women who adopt children with the incidence of pregnancy among previously sterile women who do not are not available. If they were, they would probably show that the incidence of pregnancy in the two groups is the same. If a woman who has been sterile for some years adopts an infant and subsequently becomes pregnant, it strikes every one as a startling event and is long remembered. On the other hand, if the same woman had not adopted an infant and had become pregnant, the occurrence would be much less dramatic and few people would pay much attention to it. Unless evidence can be advanced to the contrary, it would seem likely that the purported tendency of sterile women to become pregnant following adoption of an infant is based not on fact but on the over-emphasis which such cases receive. There is no factual evidence bearing on the relationship between the hypothalamic pathways and sterility.

INJECTION TREATMENT FOR VARICOCELE—VOLUNTARY HYPERVENTILATION WITH ALKALEMIA

To the Editor.—Are sclerosing agents used for the obliteration of a varicocele? Please refer me to technic. What are the complications? In the acute hyperventilation syndrome of the hysterical type I have found that breathing into a paper bag dramatically relieves the pain and spasm. Has this been reported before? I have been unable to find any reference in the literature available to me and want to report my case.
A. M. Winter, M.D., New York

ANSWER.—The injection treatment of varicocele is fully described in the monograph of Penn Riddle (Philadelphia and London, W. B. Saunders Company, 1940, p. 231). The most important point about varicocele is that it should be left alone unless it produces dragging pain in the testis or low back pain. Many neurotic persons suffering from a moderate degree of varicocele would be much better off if left alone. They can and frequently do develop a severe sexual neurosis.

Voluntary hyperventilation which may lead to alkalemia and tetanic contractions has been treated by ammonium chloride (Kerr, W. J.; Dalton, J. W., and Gliebe, P. A.: *Some Physical Phenomena Associated with the Anxiety States and Their Relation to Hyperventilation*, *Ann Int Med*, 11:961 [Dec.] 1937). Rebreathing from a bag increases carbon dioxide in the blood and thus counteracts alkalemia as long as the patient is unable to blow off the excess carbon dioxide.

DIETHYLSTILBESTROL AND MALE HYPERSEXUALITY

To the Editor.—I read in *Queries and Minor Notes* in the July 8 issue of *The Journal*, page 760, the problem submitted by George L. Kennedy, M.D., of Faribault, Minn., concerning the use of diethylstilbestrol in male hypersexuality. An article of mine entitled "Diethylstilbestrol in the Management of Psychopathological States in Males (1) Preliminary Report" was published in the *Journal of Nervous and Mental Disease* (99:528 [June] 1944). Dr. Kennedy's problem is apparently similar to my own (see 1944). Approximately eighteen months a study has been in progress at the hospital, and the article mentioned constitutes the preliminary report of this study.
Robert M. Foote, M.D., Fort Worth, Texas

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 7

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

OCTOBER 14, 1944

THE CLINICAL USE OF PENICILLIN IN GENITOURINARY INFECTIONS

CHAIRMAN'S ADDRESS

COMMANDER GERSHOM J. THOMPSON
MEDICAL CORPS, UNITED STATES NAVAL RESERVE

The Oxford investigators Abraham, Florey and their associates¹ were the first to call attention to the fact that penicillin in high dilution possesses strong antibacterial action on cultures of *Neisseria gonorrhoeae*. They also described a case of an infant afflicted with *Staphylococcus aureus* pyelonephritis in which the urine was quickly sterilized by comparatively small doses of the drug. Herrell, Cook and Thompson² described a series of 5 cases of gonorrhea in which response to treatment was dramatic. The extreme value of this drug in the treatment of infections of the genitourinary tract was further elaborated by Mahoney and his associates.³

Because of its particular value in gonococcal infections and owing to the fact that such infections are responsible for a considerable amount of disability in the armed forces, penicillin has been used in thousands of such cases during the past year or more. Through its use many service men have been quickly returned to duty. At first it was employed only in cases in which the infection resisted treatment with the sulfonamide compounds, but recently authorization for its use in all cases of gonorrhea has been granted. I report a series of cases which have been observed at a large naval hospital. In addition to cases of gonorrhea a number of cases in which treatment has been given for so-called nonspecific infection of the genitourinary tract will be discussed.

DESCRIPTION OF THE DRUG

The sodium salt of penicillin is a very fine crystalline or powdery light yellow substance. In solution it is light brown to light yellow, depending on the dilution.

Concerning the sodium salt the Floreys⁴ wrote:

- This substance is extremely soluble in water but is destroyed by boiling, by acids and alkalis, by certain heavy metals, by

Read before the Section on Urology at the Ninety-fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the United States Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

1. Abraham, E. P.; Chalm, E.; Fletcher, C. M.; Gardner, A. D.; Hestley, N. G.; Jennings, M. A., and Florey, H. W.: Further Observations on Penicillin, *Lancet* 2: 177-188 (Aug. 16) 1941.

2. Herrell, W. E.; Cook, E. N., and Thompson, Luther.: Use of Penicillin in Sulfonamide Resistant Gonorrheal Infections, *J. A. M. A.* 122: 289-292 (May 29) 1943.

3. Mahoney, J. F.; Ferguson, Charles; Buchholtz, M., and Van Slyke, C. J.: The Use of Penicillin Sodium in the Treatment of Sulfonamide Resistant Gonorrhea in Men, *Am. J. Syph., Gonorr. & Ven. Dis.* 27: 525-528 (Sept.) 1943.

4. Florey, H. W., and Florey, H. W.: General and Local Administration of Penicillin, *Lancet* 1: 387-397 (March 27) 1943.

oxidizing agents and by enzymes produced by air and other bacteria. Penicillin is bacteriostatic and not bactericidal, at least in concentrations likely to be used therapeutically, and reliance must therefore be placed on the body defenses, both humoral and cellular, to destroy the bacteria present in a lesion while penicillin prevents their multiplication.

Steady progress in the manufacture of penicillin has resulted in an increasingly pure product. The unit value varies from 50 units per milligram upward depending primarily on the purity. It is said that pure crystalline penicillin has a strength of about 1,600 units per milligram.

The drug was originally supplied packaged in glass ampules, but on request the various manufacturers now dispense it in vacuum sealed, rubber stoppered bottles containing 100,000 units each, to which isotonic solution of sodium chloride or another diluent in the proper amount can be added. Concentration of either 5,000 or 10,000 units per cubic centimeter should be used, as neither is irritating when injected intramuscularly. Further dilution can be made from this more concentrated preparation if continuous intravenous drip administration is desired. The stock solution should be stored in the icebox between injections.

The mode of action of the drug is uncertain. Studies have shown that blood and urine concentrations are highest about an hour after intramuscular injection, while after ninety to one hundred and forty minutes the methods of testing which are in use at the present time reveal its complete elimination. A constant level in the blood seems unnecessary, quite in contrast to the requirement in sulfonamide therapy. The methods of assaying the amount of penicillin in blood and urine are still rather crude, and until the substance is synthetically crystallized in commercial quantities and some colorimetric method is worked out the estimation of blood and urine levels will probably remain inexact.

Estimation of blood levels in clinical urologic practice is unnecessary for, given a penicillin sensitive organism, the important test of whether sufficient quantities of the drug have been given is whether the patient gets well. Because of the scarcity of the product a great deal of effort has been bent to finding a minimal effective dose; but when penicillin is available in unlimited quantities optimal doses considerably higher than those now in use will prevail.

CLINICAL MATERIAL

Five hundred cases in which a diagnosis was made of gonococcal infection of the urethra or its adnexa and 100 cases in which the patient suffered from various nonspecific infections of the genitourinary tract form the basis for this report. All of the patients were of the male sex.

DOSAGE AND METHODS OF ADMINISTRATION

All of these patients were given penicillin by one or more of several methods. Most of the patients received the sodium salt of penicillin. In recent weeks the calcium salt has been used in a series of cases, and it seems identical with the sodium salt in its action. A number of dosage schedules and alterations of routes of administration seemed desirable in our early experience in order to find the easiest and most efficient methods for every one concerned. It seems desirable, avoiding too much detail, to record some of these efforts so that others may evaluate and discard various ideas which arise concerning treatment with the drug.

Intravenous Administration.—It seems logical that a continuous intravenous drip would insure a steady flow of the drug throughout the body and a steady excretion through the urinary tract. At first each patient was given during each twelve hour period 1 liter of isotonic solution of sodium chloride containing 20,000 units of penicillin. The injection was continued day and night for ninety-six hours. Thus a total of 160,000 units was administered. Later the dose was reduced to a total of 80,000 units given in 1 liter of saline solution during a period of twelve hours. Even though excellent results were obtained with both these schedules it soon became apparent that patients so treated were more of a nursing problem than necessary. Needles became dislodged, and feeding and toilet problems involved more detail than did intermittent intramuscular injection. The patients themselves preferred multiple puncture rather than attachment to the end of an intravenous tube and flask for a full day. The method was therefore discarded.

Intramuscular Administration.—Injection into the gluteal or deltoid muscles of a solution containing 5,000 units of penicillin per cubic centimeter seems to be the ideal treatment method for urologic cases. The injection of 20,000 units every three hours can be continued for many doses without causing irritation. When the strength of the solution was 10,000 units per cubic centimeter a number of patients complained of pain and discomfort, although these were not severe. The patients treated by intramuscular injection are ambulatory and can take care of themselves and do cleaning details or other work around the ward. The injections have been given by nurses and by hospital corpsmen who have been properly instructed, without the slightest complication. Thus the time of a medical officer is conserved in contrast to the requirements in the case of intravenous therapy.

Injections of 20,000 units each given every three hours until a total of 100,000 units has been given will result in a high percentage of cures. All the injections are given in a twelve hour period.

An attempt was made to reduce the number of injections by giving 50,000 units in each of two injections six hours apart, or a total of 100,000 units. This scheme failed miserably.

Intraurethral Administration.—It occurred to me that perhaps intraurethral instillation might be effective. Ten patients were treated by injecting intraurethrally 3 to 4 cc. of solution containing 250 or 500 units per cubic centimeter. A Cunningham penis clamp was used to retain the solution. This was continued for twenty-four hours, penicillin being reinjected after each

voiding. The urine cleared promptly and within twenty-four hours was crystal clear in all cases. However, three to four days later urethral discharge reappeared. Apparently, a few organisms lodged deep in Littre's glands and not reached by the solution provided a source of reinoculation, and after the usual incubation period urethritis again developed. Whether intraurethral injections repeated several times daily for a week or so would result in cure, I do not know. For obvious reasons this scheme of treatment was not tried. Whether penicillin solution injected locally after venereal exposure would act as a prophylactic agent is doubtful. Perhaps it would be as effective as strong protein silver (protargol). A single injection of 20,000 to 50,000 units given intramuscularly might be quite efficient. No observations along this line have been made.

Intramuscular and Intraurethral Administration.—A group of patients, in the interest of conservation of the drug, was treated by intramuscular injection of 15,000 units every three hours for four doses or a total of 60,000 units, after which 4 cc. of a dilute solution of penicillin (250 units per cubic centimeter) was injected intraurethrally and held for thirty minutes. The results by this method were not spectacular and it was therefore discontinued.

Oral Administration.—Oral administration is generally ineffective because the drug is destroyed by the gastric acid. In cases in which there is achlorhydria, effective blood and urine concentration apparently can be obtained. Rammelkamp and Helm⁵ administered penicillin to 2 patients who had pernicious anemia and found satisfactory blood and urine concentration levels. Florey¹ found as little as 1,000 units given every three hours by mouth to an infant who had staphylococcal infection of the urinary tract quite effective.

I have tried oral administration in a small series of cases, supplementing the penicillin with large doses of sodium bicarbonate, but the results have been unsatisfactory. Quite likely some effective method of oral administration will be evolved later.

Intramuscular Injection of Slowly Absorbing Solutions.—After the great efficacy of penicillin in as short a time as twelve hours in cases of gonorrheal urethritis had been established, it was only natural to try to evolve a one injection method of treatment. The usual vehicles for insulin, such as protamine zinc and globin zinc, were considered. Those consulted advised against the use of protamine zinc on the ground that the large amount necessary would be irritating.

It might be thought that penicillin injected locally into the muscle might lose its potency in a few hours because of the body heat. However, Rammelkamp and Keefer⁶ found that fluid aspirated from the pleural and joint cavities twenty-two and thirteen hours after injection showed appreciable amounts of penicillin remaining.

In 6 cases 100,000 units dissolved in 10 cc. of 3 per cent solution of human globin was injected. In 3 cases the result was successful and in 3 the treatment failed. Immune globulin was tried as a vehicle without success. Serum albumin was used as a diluent on the ground that the very large molecule would promote slow absorp-

5. Rammelkamp, C. H., and Helm, J. D., Jr.: Studies on the Absorption of Penicillin from the Stomach, *Proc. Soc. Exper. Biol. & Med.* 54: 324-327 (Dec.) 1943.

6. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, *J. Clin. Investigation* 22: 425-437 (May) 1943.

tion. In a series of 10 cases there were 4 failures. At the present time, therefore, a one shot method of treatment which would be suitable for dispensary or office practice seems only a hope.

RESULTS OF TREATMENT IN GONORRHEAL INFECTIONS

Routinely, a culture of the voided urine is obtained the morning after the administration of penicillin. This is twelve to eighteen hours after treatment is concluded. The next day, or about forty-eight hours after the first injection, a culture is obtained from the prostatic fluid. In practically all instances these post-treatment cultures were negative.

Studies of the purulent urethral secretion, the sediment from the centrifuged urine and the prostatic secretion by Gram's stain are very reliable methods of studying clinical response to treatment. In a number of cases specimens stained by Gram's method were studied hourly after the first injection. In many cases within

TABLE 1.—Details of Treatment of Gonorrhea with Penicillin

How Treated, Units	Doses	Total Units	Cases Cured	Failed	Per Cent Cured
20,000 units in 1 liter of saline solution; continuous intravenous drip for 96 hours....	..	160,000	10	0	100
100,000 units in 2 liters of saline solution; continuous intravenous drip for 12 hours....	..	100,000	28	26	93
80,000 units in 1 liter of saline solution; continuous intravenous drip for 12 hours....	..	80,000	30	29	97
15,000 units every 3 hours intramuscularly; then intravaginal injection of 4 cc. of solution containing 250 units per cubic centimeter.....	4	61,000	20	17	85
50,000 units intramuscularly for 2 doses (6 hours apart)..	2	100,000	20	11	55
100,000 units dissolved in 10 cc. of 5% human globin injected intramuscularly	1	100,000	6	3	50
100,000 units dissolved in 10 cc. of 2% serum albumin injected intramuscularly	1	100,000	10	6	60
20,000 units every 3 hours intramuscularly	10	200,000	10	10	100
20,000 units every 3 hours intramuscularly	5	* 100,000	366	358	98

two hours the gonococci had disappeared from the urethral secretion. Within four to six hours no organisms could be found even by the most minute study. Before complete disappearance the gonococci gradually take on a deeper stain, so that they appear quite red and become greatly swollen and irregular. Many seem fused together instead of diplococci in shape. Later, stains of the urethral discharge or the centrifuged urine show a profusion of pus cells and some epithelial debris but no organisms.

The dramatic cessation of the purulent urethral discharge is the most impressive point in penicillin therapy. Within a few hours after the first injection the patient will usually note a great reduction of discharge. The following morning in most instances the urethra appears dry. However, in some cases a small mucopurulent or mucous drop can be expressed from the urethra each morning for several days or even as long as a week. This should not prompt one to treat the patient again with penicillin. Study of the sediment of the first glass urine by Gram's stain or by culture will fail to reveal gonococci and in all but a small percentage of cases in which 100,000 units is used a cure will result (table 1).

In analyzing the result of treatment it must be kept in mind that the patients who were the subject of this report were followed for relatively short periods. However, it is my impression that in extremely few cases will there be an exacerbation of a latent prostatic focus. If the culture of the prostatic secretion is negative forty-eight hours after treatment it will usually remain negative.

One important point in considering results of therapy is that at present there is no great assurance that an ampule of penicillin contains the exact amount stated on the label. It is my impression that many of these patients received much more than 100,000 units. This is not the fault of the manufacturer; rather it can be attributed to the inexact methods of assay which are now available.

It will be noted (table 1) that failure was reduced to 2 per cent when the recommended schedule of 20,000 units every three hours for five doses was employed. Further it should be emphasized that, in the cases in which the result was classed as a failure, cure was subsequently obtained by a course of injections of penicillin. In no case did the infecting organism prove penicillin resistant and necessitate other methods of treatment. If enough of the drug was given, a cure was obtained in all cases.

REINFECTIONS

Sixteen patients in this series were readmitted to the hospital several months after initial penicillin therapy because of another gonorrheal infection. They freely admitted that infection developed again only after further exposure. After critical analysis it seemed that these were bona fide cases of reinfection rather than recurrence of the old infection.

COMPLICATED CASES

Acute gonorrheal epididymitis, prostatitis or seminal vesiculitis was observed in only 10 cases in this series. In 5 of these it seemed prudent to give an additional amount of penicillin; hence a second ampule of 100,000 units was injected according to the original schedule of 20,000 units per injection. Rapid cessation of perineal or testicular pain and prompt reduction of swelling and other signs of inflammation were noted in all cases. Rectal examination disclosed rapid diminution of the size of the prostate gland, so that within three or four days the gland was practically normal in size. Cultures of the secretion at this time were reported negative, although pus cells persisted. Examination a week later showed the prostate secretion normal.

Inflammation in the joints, so-called gonorrheal arthritis, was observed in 6 cases. In 1 case the swollen knee joint was aspirated and a dilute solution of penicillin injected into the joint space. No striking benefit was noted as a result. Nor did continued injections of penicillin seem to aid in the other cases in which there was joint involvement. In all of them, however, the gonorrheal infection in the urethra and prostate quickly subsided and repeated cultures remained negative. The fluid aspirated from the joint cavities was never positive at any stage of the disease.

RESULTS IN NONSPECIFIC INFECTIONS

In 100 cases of infections in the genitourinary tract in which one or more strains of bacteria other than gonococci were isolated by culture or identified by Gram's stain, treatment has been given during the past

six months with penicillin and the results noted. It has not been possible in many cases to study the results of therapy for as long an interval as might be desirable. However, definite opinion as to the worth of the drug has been formulated. In the majority of these cases a mixture of organisms has been noted, some of which are sensitive to the action of penicillin while some of them are not. Study by Gram's stain of the urethral or prostatic secretions will reveal the disappearance of gram-positive organisms while gram-negative organisms persist.

In table 2 the cases are listed according to diagnosis and the effect of treatment. The series of cases is not as comprehensive as might be desired but, nevertheless, some idea of the worth of penicillin in such cases can be obtained.

Acute Nonspecific Prostatitis.—In the 4 cases observed the response to treatment did not seem as rapid as it was in the cases of acute gonorrheal prostatitis.

Cultures of prostatic secretion in 3 cases were reported to be *Staphylococcus albus* and in the fourth case nonhemolytic *Streptococcus*. In the latter case the acute inflammatory process was confined to the right lobe of the gland; the region was quite indurated

TABLE 2.—Nonspecific Infections Treated with Penicillin

Diagnosis	Cases	Improved	Unimproved
Acute prostatitis.....	4	4	0
Chronic prostatitis.....	30	24	6
Urethritis.....	36	33	3
Acute epididymitis.....	8	7	1
Balanitis.....	6	6	0
Infected wound.....	3	3	0
Cystitis, interstitial.....	3	0	3
Pyelonephritis.....	10	8	2

and extremely tender, suggesting abscess, but there was no fluctuation. This patient also had keratitis. He was given fifteen injections of 15,000 units each. Almost immediate improvement of the ocular condition was noted and within a week the region in the prostate gland had changed to normal consistency and the expressed secretion contained much less pus than before and no organisms.

Chronic Prostatitis.—An excellent response was noted in 24 of the 30 cases in which a diagnosis of chronic prostatitis was made. The best indication of chronic infection in the prostate gland is the presence of pus cells and the finding of bacteria in stained smears of the expressed secretion. Cultures were made in the majority of the cases. Among the organisms reported found were *Staphylococcus albus*, *Streptococcus* (hemolytic), *Streptococcus* (green producing), *Bacillus subtilis*, *Micrococcus*, diphtheroids and *Alcaligenes fecalis*. In my experience more knowledge and a better idea of the severity of the prostatic infection can be obtained by noting the polymicrobial character and relative number of organisms in a smear stained by Gram's method than by cultures. I believe that many urologists will concur in this opinion.

Frequently gram-positive cocci are found in a smear when a culture of the same material is reported negative. For this reason in my opinion cultures provide corroborative data, but conclusions should not be based on cultures alone.

Of greatest importance is a correlation of all the symptoms and signs, including size of the gland and presence of induration. In 80 per cent of the cases in which penicillin was used there was improvement—in the majority, pronounced; in only a few, moderate. How many cures were obtained is conjectural, since past experience shows that chronic prostatitis does not often remain cured, and few of the cases in this series have been followed for more than a few months. The results to date, however, are very encouraging. A reduction of the pus cell count of the expressed secretion from 150 or more cells to the high dry field down to 8 or 10 per field is the rule rather than the exception. Such results may be seen a few days to a week after a course of five injections of 20,000 units each. In some cases a second course of 100,000 units two or three weeks after the first was necessary to obtain a really striking effect.

Nonspecific Urethritis.—In 36 cases in which the diagnosis of nonspecific or nonvenereal urethritis was made, treatment with penicillin was given. Purulent urethral discharge presenting as a morning drop was the chief complaint. These patients usually had noted the infection for months prior to admission. Gonorrheal infection was first ruled out. Routine examination of the prostate and the passage of urethral sounds to detect strictures of small or large caliber were done. Urethroscopy was done in most cases. A narrow meatus was found in some instances and meatotomy was performed. In the majority, however, there was no sign of urethral abnormality other than the infection. Response to penicillin therapy in this group is not as good or as dramatic as it is in the case of gonorrheal infections. However, in the uncomplicated cases a high percentage of patients noted improvement as evidenced by reduction or cessation of discharge. Shreds disappeared from the urine in some cases in which they had formerly persisted for months in spite of all other treatment.

It should be emphasized that in any case of chronic nonspecific urethritis thorough examination should be made to detect stricture and so forth before institution of treatment.

Nonspecific Acute Epididymitis.—In 7 of 8 cases there was notable response to a course of ten injections of 20,000 units each. In the 1 case in which there was no appreciable benefit the infection developed within a few days after transurethral prostatic resection. Acute inflammation in the epididymis usually is accompanied by an infection in the corresponding seminal vesicle, and sometimes the adjacent testicle is also involved. Often an acute hydrocele forms. These patients suffer great pain and discomfort and are quite disabled. The prompt relief of pain and the rapid reduction of the tenderness and swelling were most convincing of the efficacy of penicillin. In no case was epididymotomy or other incision required.

Balanitis and Wound Infections.—In 6 cases in which there was considerable infection of a redundant, untractable prepuce treatment was by local instillation of a solution containing 250 units of penicillin per cubic centimeter. Improvement was so remarkable that circumcision was possible within forty-eight to seventy-two hours. Dorsal slit was avoided in all cases. In 2 cases wound infection following nephrectomy was quickly cleared up by instillations of 5 to 10 cc. of the

dilute solution. Apparently the antibacterial action of these solutions, when they are instilled into wounds, lasts for many hours. It has not been necessary to instill the solution oftener than twice daily. In 1 case of purulent inguinal adenitis which required incision and drainage the infection healed with remarkable rapidity as a result of instillation of penicillin solution. There was practically no drainage after the first instillation. Instillations of a few cubic centimeters once daily were continued until healing was practically completed.

Interstitial Cystitis.—In 3 cases interstitial cystitis was treated by intramuscular injection of 10,000 units every three hours for fifty doses. In addition in 2 cases intravesical instillation twice daily of 30 to 45 cc. of a solution containing 250 units per cubic centimeter was done. The patients were able to hold the solution in the bladder for an hour or two. No irritation was noted. Cultures of the urine were reported *Staphylococcus albus* in 2 cases and diphtheroids and *Staphylococcus* in the other. In none of the cases was there any benefit which could be attributed to penicillin. Subsequently intravenous injections of neosarsphenamine and irrigations of silver nitrate were given. All were benefited by this treatment.*

Pyelonephritis.—As far as I have been able to determine, penicillin is equally effective in alkaline or acid urine. In several cases infection of the upper part of the urinary tract in which there was a mixture of organisms I have employed another drug such as ammonium mandelate or sulfanilamide in addition to penicillin, hoping that the combined effect would result in sterilization of the urine. Abraham and Chain⁷ have shown that gram-negative rods, including *Escherichia coli*, actually secrete an enzyme, penicillinase, which destroys penicillin. Results of combined therapy in some cases therefore might well be superior to the use of penicillin alone.

In practically all of the cases of pyelonephritis which I have seen the disease has been acute, and it is well known that a large percentage of these will recover spontaneously. It is therefore extremely difficult to evaluate the particular virtue of penicillin. In 2 cases of chronic renal infection complicated by the presence of multiple calculi not sufficiently large to warrant operation the condition was treated with penicillin. In these there was a mixture of organisms, both gram-positive cocci and gram-negative bacilli. The cocci disappeared from the urine after penicillin therapy, but the bacilli persisted. Cultures following treatment revealed *Proteus vulgaris* in 1 case and *Escherichia coli* in the other. In the case in which there was *Proteus* infection a catheter was introduced into the renal pelvis and lavage with solution G and solution M⁸ was performed. This resulted in a remarkable reduction of the number of organisms which could be found in stained smears, but two days after lavage was discontinued the bacilli reappeared in great number. No effect on the stones was observed.

I believe that penicillin will be of great value in the treatment of renal infections due to a susceptible organism when the patient is unable to tolerate sulfonamide compounds. For infants and small children suffering

from acute renal infection it should have particular value, because the risk of toxic reactions from sulfonamide compounds is greater for them than for adults.

It is possible in any case to make tests in vitro to determine the penicillin sensitivity or resistance of the particular organism. However, because of the fact that renal infections are often of mixed type a clinical trial would seem more practical than a test in vitro.

TOXIC REACTIONS

No serious toxic reactions were noted in any of the 600 cases. One patient had an elevation of temperature to 101.5 F.,* but this was attributed to some contaminant rather than to the penicillin. Several days after treatment 2 patients had a mild macular eruption which faded quickly. Three patients had an id reaction on the palms which very definitely was precipitated by injections of penicillin in my opinion.

Attention should be directed to the lack of local reaction, the ease of administration and the lack of any systemic symptoms even after large doses. In a number of cases in which treatment was given for conditions other than urologic disease, doses of 500,000 units during a period of twenty-four hours have been employed without toxic manifestations. Therefore in urologic cases one need not be hesitant about using much larger doses of the drug than have been suggested in this paper.

It is unnecessary to alter the diet in any way in my opinion. In cases of septicemia, chronic osteomyelitis or severe systemic infections, changes of diet might be important while the drug is being administered, but in urologic practice any change of diet is unnecessary and superfluous.

CONCLUSIONS

1. Penicillin is a particularly valuable drug for the treatment of gonorrhea. The most practical method of administration is the intramuscular injection of a solution containing 5,000 or 10,000 units per cubic centimeter. Doses of 20,000 units injected every three hours until 100,000 units has been given will result in cure in fully 98 per cent of the cases.

2. Penicillin is unstable in solution and at room temperature will rapidly lose its antibacterial power. Solutions should be freshly prepared and kept in the icebox between injections.

3. Penicillin is an extremely useful drug in the treatment of various nonspecific infections of the genitourinary tract. If the infection is caused by penicillin sensitive organisms the result of treatment is excellent. In most cases, however, the infection is of mixed type and the result of therapy is not dramatic. Nevertheless it is worth while. Penicillin combined with other urinary antiseptics in these cases might well be superior to other methods of treatment.

4. The results of treatment in urologic cases can be determined well by making repeated Gram's stains of the urethral or prostatic secretions or of the sediment of the centrifuged urine.

5. Treatment with penicillin is so devoid of toxic reaction that there is no reason to outline difficult schedules or to use complicated methods. The physician need not be fearful of using too much of the drug and should follow the dictum that the dose of any medicine is "enough"

7. Abraham, E. P., and Chain, E.: An Enzyme from Bacteria Able to Destroy Penicillin, *Nature*, London 146: 837 (Dec. 28) 1940.

8. Sulz, H. I., and Albright, Fuller: Dissolution of Phosphate Urinary Calculi by the Retrograde Introduction of a Citrate Solution Containing Magnesium, *New England J. Med.* 228: 81-91 (Jan. 21) 1943.

PENICILLIN IN THE PREVENTION AND TREATMENT OF CON- GENITAL SYPHILIS

REPORT ON EXPERIENCE WITH THE TREATMENT OF
FOURTEEN PREGNANT WOMEN WITH EARLY SYPHILIS
AND NINE INFANTS WITH CONGENITAL SYPHILIS

J. W. LENTZ, M.D.

NORMAN R. INGRAHAM JR., M.D.

HERMAN BEERMAN, M.D.

AND

JOHN H. STOKES, M.D.

PHILADELPHIA

The treatment of the pregnant syphilitic woman and of the congenitally syphilitic infant with weekly injections of neoarsphenamine or mapharsen supplemented by a bismuth preparation, although eminently satisfactory from the standpoint of both preventive and curative medicine, still has several aspects in which improvement may be expected. These facts have led us to try penicillin in the treatment of these conditions with the hope that it might be possible to eliminate some of the deficiencies in present day therapy.

Included among the factors in the prevention and treatment of congenital syphilis which we would like to see improved by the discovery and application of new drugs and new technics, the following may be mentioned:

1. Arsenotherapy is relatively toxic. Although, generally speaking, arsenicals are well tolerated and safe to use in the average case,¹ reactions do occur which interfere with treatment or at times preclude their use entirely, and death of the expectant mother has been known to result from chemotherapy for syphilis during pregnancy.² A safer drug is accordingly a desideratum.

2. Antepartum syphilis treatment, as usually administered, is not curative of the mother's syphilis. For this purpose it must be continued for long periods post partum and, in order to prevent the birth of syphilitic infants, it must usually be repeated in each subsequent pregnancy.³ It is true that intensive arsenotherapy (five day drip) has been employed successfully for a small number of pregnant women with early syphilis,⁴

but this approach to the prevention of congenital syphilis is not generally accepted.⁵ It is relatively toxic and must be considered dangerous in routine medical practice and a questionable choice even under ideal circumstances. One of the extremely difficult public health and social problems in this field has been the postpartum observation of the mother for syphilis.⁶ A drug which would be curative during the pregnancy of both mother and child is to be wished for.

3. Although several short series of cases appear in the medical literature in which 100 per cent normal infants have resulted from adequate arsenotherapy of the syphilitic pregnant woman,⁷ larger series show a definite residuum of syphilitic infants sometimes in spite of ideal therapy.⁸ This is usually in the neighborhood of 5 to 8 per cent diseased infants if the treatment has approached accepted adequacy. Particularly difficult cases for intravenous arsenotherapy are those in which treatment is not commenced until the latter months of the pregnancy, particularly if the expectant mother is in the early stages of her disease.⁹ Under such circumstances a very high percentage of infants are syphilitic in spite of therapy. This problem is bound to the permeability of the placenta, to the arsenobenzene derivatives and to the effectiveness of the uncertain quantities of the drug which do pass from the mother to the child after the fetus in utero has been infected.¹⁰ In such instances the placental membrane must be traversed by a curative dose of the drug if a normal infant is to be born. An effective spirilicide which will readily traverse the placenta is still to be hoped for.

4. Three principal factors still complicate the treatment of infantile congenital syphilis. They are the extreme caution with which therapy must be inaugurated when the disease is manifest,³ the prolonged course of treatment essential to cure¹¹ and again the residue of patients who are not cured by arsenotherapy and bismuth, a proportion which increases rapidly with the age of the infant at the time treatment is begun.

In addition, the treatment of the syphilitic pregnant woman and, more than this, the observation of the treated syphilitic woman who subsequently becomes pregnant are both critical experiments in the testing of the effect of the new drug. Since the fetus is intimately associated with the mother and is almost uniformly infected if the maternal syphilis is active and untreated, these circumstances give the counterpart in the human being of the inoculation test of cure in the rabbit or other experimental animal. In the woman the

From the Institute for Control of Syphilis, University of Pennsylvania. This work was done under a contract between the University of Pennsylvania and the Office of Scientific Research and Development, recommended by the Committee on Medical Research.

In addition to the directing investigators whose names appear as authors, the following contributed directly to the observations in this paper: H. H. Perlman, M.D., chief, Syphilis Clinic, Children's Hospital, Elizabeth Kirk Rose, M.D., representing the pediatric staff, and G. D. Gammon, M.D., representing the neurologic staff of the Hospital of the University of Pennsylvania; Virgine Wammoth, M.D., and O. M. Carozzino, M.D., representing the staff of the Syphilis Clinic, Philadelphia General Hospital. Roentgenographic studies were performed by the Department of Roentgenology and Radium Therapy of the Hospital of the University of Pennsylvania (E. P. Pendegress, M.D., director). Quantitative titrated blood serologic tests for syphilis were carried out by Mrs. Verna Mayer Stern, serologist to the Syphilis Clinic, Hospital of the University of Pennsylvania. Attendance follow up after termination of penicillin treatment was carried out under the immediate direction of Public Health Nurse Dolores Hill Middleton of the staff of the Institute for the Control of Syphilis, University of Pennsylvania.

1. Cole, H. N., and others. Cooperative Clinical Studies in the Treatment of Syphilis. *Syphilis in Pregnancy*, Ven Dis Inform 17: 39 (Feb) 1936.

2. Ingraham, Norman R., Jr. Complications Due to Arsenical Therapy in Syphilitic Pregnant Women. Report of Seven Maternal Deaths. *J. A. M. A.* 112: 1537 (April 22) 1939. Moore, J. E. Arsenical Reactions in Pregnant Women. *Am J Syph, Gonorr & Ven Dis* 23: 518 (July) 1939. Arnell, R. E., and Guerrero, W. F. Arsenical Encephalitis During Pregnancy, with Report of 2 Fatal Cases. *New Orleans M. & S. J.* 94: 482 (April) 1942.

3. Cole, H. N.; Jeans, P. C., and others. *Syphilis in Mother and Child*, Ven Dis Inform supplement 7, U. S. Govt Print Office, 1940.

4. Sadock, J. F., and Shaffer, T. C. Observations on the Massive Dose Arsenotherapy of Early Syphilis by the Intravenous Drip Method. Pregnancy and Its Outcome. Associated with or by the Treatment of III. Early Syphilis by Massive Arsenotherapy. *Yale J. Biol. & Med.* 11: 365 (March) 1942. Rattner, H. The Treatment of Early Syphilis by the Concurrent Administration of Arsenic and Bismuth in a Period of Five Days. *J. A. M. A.* 122: 986 (Aug 7) 1943.

5. Stokes, J. H.: The Wartime Control of Venereal Disease. Problems in the Application of Recent Scientific Discoveries. *J. A. M. A.* 120: 1093 (Dec 5) 1942.

6. Ingraham, N. R., Jr.: The Importance of Treatment in the Control of Congenital Syphilis. *Ven Dis Inform* 10: 124 (May) 1938. Ingraham, L. B., and Ingraham, N. R., Jr., and others. The Prevention of Congenital Syphilis in the Large Urban Hospital. *Study of Clinic Administration*, *Am J Syph, Gonorr & Ven Dis* 25: 731 (Nov) 1941.

7. Greenlees, J. R. C., cited by Ingraham, N. R., Jr., and Kohler, J. E. The Diagnosis and Treatment of Syphilis Complicating Pregnancy. *Am J Obst & Gynec* 27: 134 (Jan) 1934. Speiser, M. D. Results of Treatment in the Antepartum Syphilis Clinic at Bellevue Hospital, *ibid* 35: 1013 (June) 1938. Moseler, V., Callaway, J. L., and Sharpe, J. S. A Study of the Incidence of Syphilis in Pregnant Women and Some Results of Therapy. *ibid* 30: 990 (Dec) 1940.

8. McKelvey, J. L., and Turner, T. B. Syphilis and Pregnancy. An Analysis of the Outcome of Pregnancy in Relation to Treatment in 943 Cases. *J. A. M. A.* 102: 503 (Feb 17) 1934. *Syphilis in Pregnancy*.

9. Ingraham, N. R., Jr. The Management of Syphilis in the Newborn and During Early Childhood. *Pennsylvania M. J.* 12: 950 (May) 1939.

10. Eastman, N. J. The Arsenic Content of the Human Placenta Following Arsenamine Therapy. *Am J Obst & Gynec* 21: 69 (Jan) 1931. Eastman, N. J., and Dippel, A. L. The Passage of Arsenic Through the Human Placenta Following Arsenamine Therapy. *Johns Hopkins Hosp* 52: 288 (Nov.) 1933. Stokes, J. H., and Ingraham, N. R., Jr. Diagnosis and Treatment of Congenital or Perinatal Syphilis. *M. Clin North America* 28: 1575 (Nov.) 1937.

11. Smith, F. R., Jr. Congenital Syphilis in Children. *Am J Surg & Neurol* 12: 532 (Oct.) 1935.

ultimate test of cure of her syphilis will always remain her ability to give birth to normal children in subsequent pregnancies, even though no further antisyphilitic treatment is administered.

MATERIAL

The cases used for this report consist of 12 pregnant women with symptomatic early syphilis and 2 with early latent syphilis and 9 infants with early congenital syphilis. None had received any type of antisyphilitic therapy prior to treatment with sodium penicillin.

The first pregnant woman started treatment on Nov. 19, 1943 and was delivered March 20, 1944. The maximum period of observation, therefore, at the time of writing this paper (June 29, 1944) has been for the mother seven and one-half months and for the newborn infant three months. Seven of the mothers had not delivered at the time this material was analyzed.

The first infant with congenital syphilis commenced his treatment on Feb. 8, 1944, so that in this case the maximum period of observation is about four months. All patients treated have been included in this report in order to evaluate the initial response to therapy and the contraindications to treatment, if any.

The material has been drawn from the clinics and wards of several of the Philadelphia hospitals¹² and observations were made by members of the University of Pennsylvania Penicillin Panel under the chairmanship of John H. Stokes, M.D.

RESULTS

In the Pregnant Syphilitic Woman and Her Child.

The clinical response to treatment and the result of delivery in each of the 7 pregnant women who have reached term is summarized in table 1. This table also shows graphically the serologic response to treatment of both mother and child. In each instance an apparently normal infant has resulted at full term except in case 76, in which the infant was considered to be premature because it weighed only 4 pounds 10½ ounces (2,112 Gm.) at birth, but it appeared otherwise healthy. Dark field examination of the umbilical vein was negative in 5 instances and not performed in 2. Roentgenograms of the long bones during the neonatal period performed in 4 cases at birth and repeated at the age of 6 weeks or later in every instance were all normal. Three of the infants had positive cord and neonatal blood serologic tests in every case with quantitative titers either equal to the mother's or lower. In case 13, the mother's blood serologic test was 4 Kline units at birth and the infant's ½ unit; in case 25 the mother's titer was 32 units at birth and the infant's 16 units; in case 49 the mother's and infant's titers were both 64 units.

In each instance in which the infant's blood serologic test was positive at birth it has fallen sharply postnatally

12. The Hospital of the University of Pennsylvania supplied 8 cases for this study, the Philadelphia General Hospital 11 cases, the Children's Hospital 2 cases, the Pennsylvania Hospital and the St. Luke's and Children's Medical Center each 1 case.

FOOTNOTES TO TABLE

Symptomatic clinical response in the mother in each instance was immediate.

* Given in Kline units for sake of uniformity. Tests were checked with quantitative Kolmer Wassermann and Eagle flocculation with comparable results.

† The seven mothers, as of Sept. 28, 1944, have been followed a maximum of 226 days post penicillin (average 216 days). All have become seronegative except case 4 and case 49 (each less than 1 unit of reagin) and case 71, which retains 32 units. All are clinically normal. Each of the infants has remained clinically and serologically normal for a maximum period of 124 days post partum (average 124 days). One of the fourteen pregnant women mentioned in the text, who was treated with 1,200,000 units of penicillin, developed infectious relapsing lesions just prior to delivery, 122 days post penicillin. (Kolmer Wassermann.)

TABLE 1.—Summary of Clinical Course of Seven Pregnant Women with Early Syphilis Treated with Penicillin #

Clinical Data	Days After Penicillin	Mother Serologic Test, Kline Units *	Days After Delivery	Infant Serologic Test, Kline Units *
Case 4. B., 17 years. U. of Pa. H.	0	256		
	10	256		
Secondary syphilis	31	64		
Penicillin started 11/19/43	74	64		
Total dose: 1,200,000 units	95	5		
Delivered 3/20/44	105	64		
	115	8	0	Negative
	122	32	17	Negative
Infant: weight 6 lbs. 1 oz.	139	4	45	Negative
	175	32	53	Negative
Dark field umbilical vein negative, normal physical examination, roentgenogram of long bones normal	207	61	74	Negative
	223	8	101	Negative
Case 13. B., 29 years. P. G. H.	0	128		
Secondary syphilis	9	128		
Penicillin started 12/16/43	26	32		
Total dose: 1,200,000 units	68	16		
Delivered 3/29/44	89	2		
	104	4	0	0.5
Infant: weight 6 lbs. 2½ oz.	124	16	20	Negative
	141	Negative	37	Negative
Dark field umbilical vein negative, normal physical examination, roentgenogram of long bones normal	159	Negative	55	Negative
	173	0.5	69	Negative
			83	Negative
Case 15. B., 16 years. Pa. Hosp.	0	128		
	10	64		
Secondary syphilis	25	128		
Penicillin started 12/24/43	39	32		
Total dose: 1,200,000 units	60	32		
Delivered 5/15/44	74	16		
	87	4		
	115	0.5		
Infant: weight 6 lbs. 11 oz.	122	Negative		
	136	Negative		
Dark field umbilical vein negative, normal physical examination	143	Negative	0	Negative
	168	Negative	25	Negative
Case 25. B., 18 years. U. of Pa. H.	0	128		
	16	64		
Secondary syphilis	29	64		
Penicillin started 1/10/44	53	64		
Total dose: 1,200,000 units	63	16		
Delivered 4/13/44	79	32		
	94	32	0	16
	103	32	9	4
Infant: weight 6 lbs. 14¾ oz.	114	Negative	20	Negative
	128	2	34	Negative
Dark field umbilical vein negative, normal physical examination, roentgenogram of long bones normal	148	4	54	Negative
	163	Negative	69	Negative
Case 49. B., 21 years. U. of Pa. H.	0	64		
Secondary syphilis	8	64		
Penicillin started 2/15/44	21	128		
Total dose: 2,400,000 units	36	64		
Delivered 4/3/44	48	64	0	64
	49	..	1	16
Infant: weight 6 lbs. 5¾ oz.	77	61	29	Negative
	95	32	50	Negative
Dark field umbilical vein negative, normal physical examination, roentgenogram of long bones normal	112	2	64	Negative
	126	2	78	Negative
Case 71. B., 22 years. U. of Pa. H.	0	128		
Early latent syphilis	14	64		
Penicillin started 3/31/44	33	128		
Total dose: 1,200,000 units	46	32		
Delivered 6/14/44	60	32		
	76	64	0	Negative
Infant: weight 5 lbs. ¾ oz.	77	..	1	0.5
Normal physical examination				
Case 76. B., 21 years. P. G. H.	0	64		
Secondary syphilis	23	128		
Penicillin started 4/5/44	27	64		
Total dose: 1,200,000 units	41	64		
Delivered 6/17/44	54	32		
	69	64		
Infant: weight 4 lbs. 10½ oz.	73	64	0	Negative
Normal physical examination				

and has become normal in less than one month. In the period of observation, none have shown any tendency to revert to positive. The remaining 4 infants were born with negative blood serologic tests for syphilis and have remained seronegative up to the time these data were compiled. In the period of observation, only 3 of the mothers have become seronegative: Patient 15 was found to be seronegative ninety-five days post penicillin and forty-seven days prior to delivery, and patient 39, who has not yet reached term, was found to be seronegative seventy-seven days post penicillin and has remained so for two months. Patient 25 was found to be seronegative sixty-nine days after delivery.

In the 7 cases in which delivery has occurred penicillin treatment was started 142, 121, 103, 93, 76, 73 and 47 days respectively prior to delivery or from the fifth to the eighth lunar months of the pregnancy respectively. In no instance was treatment instituted

after the commencement of penicillin treatment. In 2 cases threatened abortion, as evidenced by spotting and by lower abdominal cramps, occurred in 1 instance in eighteen hours and in the second case in forty-eight hours after the start of penicillin therapy. The drug was immediately discontinued but resumed in full dosage in twenty-four hours without a recurrence of symptoms. This the only type of reaction that developed in any of our pregnant patients could perhaps be considered to be a form of therapeutic shock (Hersheimer reaction) occurring in a grossly diseased area and would possibly fall in the category of placental shock, described in the older literature and occasionally seen after arsenotherapy administered without preparatory treatment to pregnant women with active syphilis. It would suggest that, in the present state of our knowledge at least, it might be best to reduce the penicillin dosage by three fourths to one half during the first

TABLE 2.—Summary of Case Records of Five Infants with Early Congenital Syphilis Treated with Penicillin

Identifying Data	Initial Clinical Findings	Weight on Admission	Total	Per Pound of Body Weight	Duration of Observation After Penicillin	Result
Case 43 P G H Race—B Sex—♂ Age—42 days Treatment started 2/8/44	D F +; skin lesions, snuffles, enlarged liver; roentgenogram: advanced osteochondritis and periostitis; serologic test positive, 120 units (Kline)	6 lbs 3 oz.	100,000 units	16,181 units	90 days	Living; normal physical examination, normal roentgenogram of long bones, negative serologic test since 5/16/44
Case 47 U. of Pa. Race—B Sex—♂ Age—18 days Treatment started 2/11/44	Premature snuffles, enlarged liver; roentgenogram: pronounced osteochondritis and periostitis, serologic test positive, 128 units (Kline)	4 lbs. 7 oz	80,000 units	18,000 units	16 days	Died 2/27/44; circulatory collapse; possible congenital heart disease; no autopsy
Case 58 Child H. Race—B Sex—♂ Age—4 months Treatment started 2/29/44	Scaling skin lesions most pronounced on palms and soles, snuffles; roentgenogram, periostitis of long bones; serologic test positive, 128 units (Kline)	12 lbs 11 oz	236,000 units	18,773 units	70 days	Normal physical examination; roentgenogram, periostitis disappearing; serologic test, 8 units (Kline) 5/17/44
Case 63 U. of Pa. H. Race—B Sex—♂ Age—3 months Treatment started 3/3/44	Malnutrition; dysphagia; serologic test positive, 64 units (Kline), roentgenogram not diagnostic	13 lbs	242,000 units	18,615 units	97 days	Normal physical examination; blood serologic test, 14 unit (Kline) 6/5/44
Case 112 St Luke's Race—B Sex—♀ Age—31 days Treatment started 3/29/44	Roentgenogram, osteochondritis and periostitis; serologic test strongly positive; associated gonococcal vaginitis	10 lbs 8 oz	111,623 units	10,431 units	8 days	Died 6/6/44; temperature elevation to 104 F.; severe diarrhea and dehydration with weight loss of 3 lbs; autopsy; gross and microscopic findings of congenital syphilis only

All of the mothers had seropositive latent syphilis and none were treated prior to birth of the infants given in the table.

* This patient developed dark field positive skin lesions on Aug. 24, 1944. The infant never became seronegative, and blood titer rose to 32 units when relapsing lesions appeared. Mother showed no evidence of open lesions at the time of relapse in the infant and was receiving treatment with phenarsine hydrochloride and bismuth subsalicylate. This was considered to be a penicillin failure and the infant was retreated with penicillin.

prior to the midpoint of the pregnancy or in the month immediately preceding term.

Method of Treating the Syphilitic Pregnant Woman.

—Each of the pregnant women who have thus far reached term had received 1,200,000 Oxford units as her total dose of sodium penicillin, with the exception of patient 71, who left the hospital without receiving her last two four hourly injections and patient 49, who received 2,400,000 units. Three additional patients who have as yet not reached term also received 2,400,000 units. The injections were given intramuscularly, each dose in approximately 1 cc. of sterile distilled water every four hours around the clock for a period of approximately eight days. The individual four hourly dosage for 10 cases was 25,000 units and for 4 cases 50,000 units.

The clinical response of infectious surface lesions to treatment of the expectant mother was very rapid. Usually, *Treponema pallidum* disappeared, as determined by dark field examination, in less than eight hours. In no case did the dark field preparation show *Treponema pallidum* longer than twenty-four hours

thirty-six to forty-eight hours of treatment of the syphilitic pregnant woman. We have followed this suggested procedure of reduced dosage during the first forty-eight hours for the last 10 pregnant women treated and have not had an additional instance of threatened abortion.

In Infantile Congenital Syphilis—Nine patients with early congenital syphilis were treated with sodium penicillin. The results in the 3 cases which have been followed long enough to make any report possible are given in table 2. Two deaths possibly not due to penicillin treatment which occurred among 9 cases thus far treated are also included in this table. The 3 living infants followed for 99, 97 and 79 days respectively after administration of sodium penicillin all became clinically normal to physical examination.

All 3 infants had relatively high blood serologic titer initially, but these dropped sharply to normal in 1 instance and to relatively low levels in the other 2 instances ($\frac{1}{2}$ unit and 8 units respectively) during the period of observation.

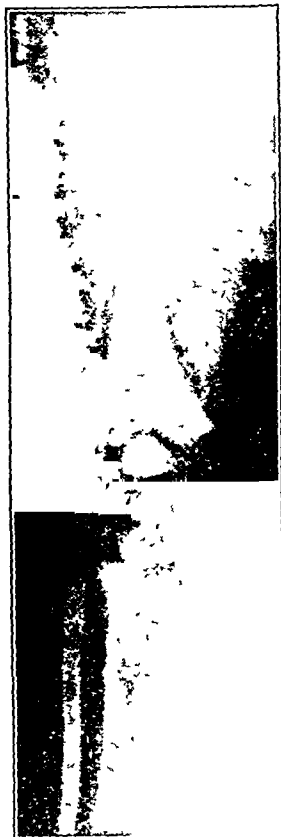
The 2 infants who showed definite roentgenographic changes of syphilitic osteochondritis and periostitis have resumed approximately normal bone development, as shown in the illustration

Dosage Employed in Infantile Congenital Syphilis.—In 6 of the 9 cases treated, the total dosage of sodium penicillin given every four hours around the clock over approximately an eight day period was between 16,000 and 19,000 units per pound of body weight. This is considerably in excess of the dosage given the majority of the pregnant women, which except in 4 cases was not in excess of 10,000 units per pound of body weight. The remaining 3 infants received respectively 2,935, 10,631 and 11,111 units per pound of body weight.

The only definite treatment reaction noted among the 7 infants who are still living was in the first infant



A Before penicillin



B After penicillin.

Improvement in syphilitic osteochondritis from penicillin therapy in case 43, in which treatment was started when the child was forty-one days old. Only the right knee joint is shown, though all the long bones had similar involvement. In A, note complete disorganization of distal femoral metaphysis and proximal metaphysis of the tibia. This area is approximately normal in B, eight or three days after commencement of penicillin.

treated (case 43 in table 2). After receiving 19,000 units of sodium penicillin in the first forty-eight hours this patient developed severe dyspnea and cyanosis, necessitating supportive treatment and the administration of oxygen. His condition remained critical during the next eighteen to twenty-four hours, during which period penicillin was withheld. The drug was then resumed in full dosage without recrudescence of symptoms and with apparently a favorable outcome. This is the only infant that thus after a ninety-nine day period has developed a completely negative blood serologic reaction

COMMENT

Our case material does not permit us to draw sweeping conclusions either as to the management of the syphilitic pregnant woman or with regard to the care of the syphilitic infant. We are of the opinion that the total dosage of penicillin used, the time dose relationship or the duration of treatment employed for our patients is not the ideal. In fact, we are experimenting with other dosage systems. On the other hand, since penicillin is now available for general medical use, it is felt highly desirable to make such factual information as exists available in the medical literature as rapidly as possible.

It is our belief that, as far as it is possible to determine with a limited number of cases, a total dosage of sodium penicillin in the same magnitude (1,200,000 units) as was originally used by Mahoney, Arnold and Harris¹³ in the treatment of early acquired syphilis in the adult is safe to use for the pregnant woman, preferably with reduced individual doses for the first thirty-six to forty-eight hours. By safe we mean that it clears the mother of infective surface lesions; with proper time dose relationship it need provoke no after-effects, and it will apparently "protect" a good proportion of the offspring from early or immediate manifestations of congenital syphilis. This is what, plus the danger of other reactions, we had come to expect of the arsenicals. Penicillin may therefore perhaps replace them. In view, however, of the demonstration of an incompletely curative result under 1,200,000 Oxford units in not less than 10 per cent of cases of early syphilis and the trend to higher dosage (2,400,000 Oxford units) on the part of some authorities and competent advisory agencies, we believe that such an advance in the total dose of penicillin is now proper and presumably safe for the pregnant woman in good general condition. By such a total dose, using a therapeutic agent with the reactionless record of penicillin, we shall, we hope, approach more nearly, if not reach, the cure of the mother with the full protection of the child.

It is not, of course, possible to say whether all the infants in the present series have escaped infection, nor will it be possible so to state short of several years of postnatal observation. It will further not be possible to evaluate the effectiveness of treatment of a syphilitic pregnant woman to prevent congenital syphilis without the analysis of much larger case material observed for a much longer time. It must also be pointed out that the permeability of the placental membrane to penicillin is at present unknown and that cases treated immediately before delivery or prior to the fifth lunar month have not as yet been reported.

There are indications that penicillin given to the mother just prior to delivery (Barksdale) is not recoverable from the umbilical vein at birth. Considering the fact, however, that untreated pregnant women with early syphilis almost uniformly give birth to dead or diseased children, we believe that it is encouraging, to say the least, that among the 14 women treated by us not a single stillbirth or neonatal death has occurred. The 7 infants delivered have, moreover, remained physically normal and seronegative for days of observation numbering 101, 81, 78, 69, 25, 5 and 1 post partum respectively.

We realize that a six months or longer period of active postnatal observation is desirable to rule out the

¹³ Mahoney, J. R., Arnold, R. C., and Harris, A. Penicillin Treatment of Early Syphilis. A Preliminary Report. *Ven. Dis. Inform.* 24: 355 (Dec.) 1943. Bloomfield, L. A., Ranta, L. A., and Kirby, W. M. M. The Clinical Use of Penicillin. *J. A. M. A.* 124: 27 (March 1) 1944.

possibility of congenital syphilis. But, if the type of medical follow-up evidence which has been found satisfactory for pregnant women treated with arsenicals is acceptable for those treated with penicillin, then it is distinctly exceptional to encounter congenital syphilis which is not detectable with the use of roentgenographic and blood serologic test procedures by the end of the second month. It seems unlikely, therefore, that the 4 infants who have passed the sixtieth day of postnatal observation will develop signs of congenital syphilis in the future, though we expect to keep them under observation for a matter of years, if possible.

Infantile Congenital Syphilis.—The present state of our knowledge with respect to the ideal treatment of infantile congenital syphilis is much less exact than is our limited knowledge even of the treatment of the syphilitic pregnant woman. Not only are we uncertain that we have developed a proper and effective total dosage or time-dose relationship for the administration of a sodium penicillin to infants with congenital syphilis, but we are in addition not certain that the method of treatment employed by us is entirely safe for the small grossly diseased infant. A word of caution as to the possible dangers of indiscriminate experimentation in this field is therefore given.

It is highly possible that the severe reaction (dyspnea, cyanosis and so on) observed in case 43 would fall into the category of therapeutic shock (Herxheimer reaction). In this instance, in spite of the severity of infection in the infant, little attempt was made to reduce the initial dosage for any considerable time, even though the first three injections (i. e. the first eight hours of treatment) were reduced to one-half the calculated dosage. We are likewise not certain that either of the two observed deaths resulted from the use of sodium penicillin as such. In each instance the death could be accounted for from another cause. In case 47 a possible congenital heart lesion and in case 112 a severe diarrhea with dehydration, uncontrolled by pediatric care, were undoubtedly important contributing factors to the deaths of the infants. In treating congenitally syphilitic infants in the past, however, the reactions caused by injudicious treatment have been considered not infrequently a primary rather than a secondary cause of death.

We believe that it may be significant that each of the infants in whom severe reaction or death occurred was less than 2 months of age. All of the other infants treated were older than 2 months at the time treatment was started. They therefore had had their infections longer, were more fully adjusted to extrauterine existence, had presumably built up some individual resistance and were better able to combat any toxemia which might develop from the too rapid treatment of overwhelming infected body tissue. We are reminded forcefully that the real danger of too energetic arsenotherapy of congenital syphilis lies in these first few weeks of life when the infection is overwhelming, the nutritional state of the infant poor and its resistance to disease undeveloped. We cannot fail to remember also that for complete safety it has been shown that it is necessary to maintain reduced dosage in these cases not for a matter of a few days but often for three or four weeks. Here, then, may be a situation in which too rapid treatment with large dosage of penicillin may be injurious to the infant even though beneficial for the disease itself.

Since the cases described were treated we have observed another infant 2 months old at the inception of penicillin therapy but not reported in detail, since

treatment was completed only on June 5, 1944. This infant, which weighed 9 pounds (4.1 Kg.), was given a total dosage of 100,000 units of sodium penicillin in eight days (approximately 11,000 per pound of body weight), but the dosage was kept much reduced from the first to the third day. Five per cent of the total dosage was given in the first twenty-four hours, 10 per cent on the second and third day each and 15 per cent on each day thereafter with no untoward reaction.

In some of the older and heavier infants we have also recently given greatly reduced doses for the first two or three days of treatment without reaction. In spite of this, however, we are not certain that reduced dosage carried out for so short a period will be effective in preventing reaction in every instance if we are here dealing with the type of therapeutic paradox in the small severely infected infant which has accompanied other types of rapidly effective chemotherapy. One necessity for safety certainly stands out with increased emphasis. This is the insistence on painstaking and experienced general pediatric care as an accompaniment to penicillin therapy.

It is too soon to discuss the proof of "cure" of syphilis in women by their ability to bear normal children in subsequent pregnancies, since this is a question which can be studied only over a period of years. If the apparently normal infants born of the women with early syphilis in this study prove on subsequent observation to be nonsyphilitic, then it is a probable but not yet an established fact that these women have been cured of their disease. The most obvious conceivable exception to this supposition would be that the infection was suppressed in the mother as a result of treatment for the several months of her pregnancy in which she was carrying the child to the point where the disease was not transmitted, only to have a recrudescence subsequent to delivery.

It should also be noted that the present report deals with early syphilis complicating pregnancy. It is not certain that these observations are necessarily applicable to the greatest problem confronting the medical profession in this field, namely latent syphilis of unknown duration complicated by pregnancy. It is highly desirable, therefore, that the question of penicillin treatment of latent syphilis complicated by pregnancy be studied as soon as possible.

CONCLUSIONS

1. There are several factors in the medical treatment of the syphilitic pregnant woman and the infant with congenital syphilis which are in need of further study and improvement.

2. It was with the thought that some solution to these problems might be found through the use of penicillin that the present study was undertaken. Sodium penicillin exclusively was employed. Experience with the treatment of 14 pregnant women with early syphilis and 9 infants with congenital syphilis formed the basis for this analysis.

3. The material is reported at this time, even though incomplete, since preliminary observations indicate that sodium penicillin has a definitely good effect both on the mother and on the child in syphilis in pregnancy and on infantile congenital syphilis. Because the drug has been released for general distribution, dissemination of even our present limited knowledge seems desirable.

4. The proper total dosage and the time-dose relationship has not been worked out to complete satisfaction either for syphilis and pregnancy or for infantile congenital syphilis.

5. The limited existing data would seem to indicate, however, that total doses of the magnitude of 1,200,000 Oxford units and 2,400,000 Oxford units given intramuscularly round the clock in approximately eight days, as used in the treatment of early syphilis, are well tolerated by the pregnant woman, with the possible exception that therapeutic or placental shock may occur, to be avoided by considerably reducing the dose for the first thirty-six to forty-eight hours of therapy. The course of expert experience with penicillin in syphilis in general suggests the desirability of the higher dosage (2,400,000 Oxford units).

6. Preliminary results indicate that "cure" or suppression of the infection takes place in a number of the mothers and, that miscarriage, stillbirth and neonatal death are averted, and the infants are born apparently healthy. It must be reiterated, however, that the period of observation for either mother or child has not been long enough to be certain that they have been cured by the dosages employed. The course of the disease has nonetheless been profoundly and favorably affected.

7. Infants with congenital syphilis make a good response to dosage of approximately 18,000 units per pound of body weight. Grossly infected syphilitic infants, however, may be injured by the injudicious use of penicillin. In the present state of our knowledge their treatment should be approached with extreme caution, with reduced dosage and with great emphasis on proper general pediatric care.

THE MEDICAL TREATMENT OF PSYCHOSOMATIC DISTURBANCES

WITH SPECIAL REFERENCE TO THE GASTRO-INTESTINAL TRACT AND FATIGUE

SIDNEY A. PORTIS, M.D.
CHICAGO

While physicians in the past have given "lip service" to the emotional status of the patient, little insight has been developed into the results of emotional factors on processes of the body. The patient has often been rebuffed because his complaints were thought to be functional; he has been dismissed as a neurotic and told "go home and quit worrying about yourself." The patient who expresses his emotional difficulty in terms related to disabilities of organs may or may not be satisfied with this diagnosis. He may become the victim of varied treatment, including even multiple operations within the abdomen. Physicians should realize that a majority of ambulatory and even of bedfast patients may have altered functions that result from disturbances of the emotions. The patient who is not conscious of his difficulties presents a bizarre collection of symptoms unrelated to any determinable organic disease. The mechanisms of such syndromes are as yet little understood, even by those who use the psychoanalytic approach to their significance. Therefore, large amounts of data should be collected which will make the physician just as certain in his knowledge of the mechanisms concerned as he is in controlling well recognized organic manifestations with which he is familiar. The patient must nevertheless be treated and his problems approached in a logical manner, while laboratory and clinical observations evolve to the level of established science.

Physicians should develop much tolerance and sympathy for patients with such complaints. Their troubles should be heard with an open mind. They should be allowed to talk—catharsis or release by expression. History of the patient's life from early childhood to the present must be recorded painstakingly without the usual haste of present day technic. However, familiarity with the technic leads the ingenious physician to many short cuts in procedure. These short cuts may arouse resentment and antagonism unless used with finesse. The physician should always be on his guard not to offend the patient.

Nothing is as private as the emotional life of the patient. He will fence with the physician and try to mislead for the same reasons that prevent him from admitting the real facts to his consciousness. He may relate dreams that are camouflaged as the reason for his symptoms. The physician must gain the confidence of the patient. Once this has been established, the task becomes easier and the resistance less. A thorough clinical and laboratory investigation should always precede the evaluation of the emotional status for two reasons: 1. The significance of symptoms must not be neglected. 2. When the established methods of investigations have failed to yield a satisfactory explanation, the physician's own assurance will be apparent to the patient; his analysis of the mechanism concerned will carry more weight and prepare the patient to accept the physician's advice. If the physician feels that the emotional factors are too deep seated and too complicated, he should recommend that the patient have psychiatric help. The "brow beating" psychiatry of the past is not the method of choice. The patient must be referred to a psychiatrist with insight into modern technics and keenly aware of the sensitivities resulting from emotional factors. The great difficulty arises in convincing the patient of the necessity for this help, because he does not want to feel that there is something wrong with his mind. As experience increases, the physician will find that the mere suggestion creates a resentment, and if the issue is not forced the patient's own desire to seek this help at a later date prevails. The art of medicine in not overtreating the patient applies here equally in not trying to persuade him to do something against his will. Once the physician is convinced of the rationale of this approach, there must be no retreat or the patient will have conquered the physician just as he has repressed or suppressed his own emotional factors.

The psychosomatic approach to disease is no easy road to clinical success. The physician will discover that it requires much study and long practice to acquire competence in this technic.

This discussion will be centered on the gastrointestinal tract, and even here treatment can only be general. I shall also elaborate on my observations of fatigue as seen in patients with psychosomatic disturbances.

The gastrointestinal tract affords a fertile field for such investigation. The abundant clinical material, the frequency of complaints relative to the digestive organs, laboratory study and roentgenologic control provide a foundation on which to build. That the digestive tract should be a seat of altered emotional response is best explained anatomically on the basis of its abundant afferent and efferent nerve supply. The ease of transmission of emotional stimuli from the hypothalamic region to the digestive organs is recognized. Furthermore, no other vital function plays such an important

role in the emotional life of the individual from early life as does eating. The relief from physical discomfort that the infant experiences while eating and the satisfaction of hunger becomes deeply ingrained in the child, being associated with a feeling of well-being and security. In addition, feeding is associated with a feeling of being loved. To a child, feeding and love become inseparable. This oral-receptive manifestation in early infancy is a natural emotional state of the child. In later life it must be suppressed, because it is not harmonious with independent adult life. The repressed oral trends may produce disturbed function leading to changes in the physiologic equilibrium. The recognition of this physiologic imbalance affords the physician an opportunity to explore the symptom complexes of patients and develop adequate and rational therapy. No one is justified in advising the therapy here outlined unless all known organic disease has been eliminated: infectious, parasitic, toxic, neoplastic and even metabolic disturbances of nonemotional origin. Serious organic changes may be masked by neuropsychiatric complaints. Keen clinical judgment should not be discarded because of a new or unestablished panacea. Physicians now recognize that a large percentage of gastrointestinal complaints are due to disturbed function having its origin for the most part in the emotional system. Gastritis, hypertrophic and even atrophic, may thus be classified. The irritability of the gastric mucosa makes it intolerant to food, and symptoms referable to this intolerance are frequently discerned. The same may be true of the duodenum, be the symptoms those of duodenitis, duodenal ulcer or even duodenal stasis.

Dyskinesia of the biliary tract without other abdominal reflex causes may and probably does have its origin in the parasympathetic nervous system. The so-called "stasis cholecystitis" which occurs in hypomotility leads to the formation of gallstones which in turn lead to trauma of the mucous lining, which may be secondarily infected and result in inflammatory disease. "Stasis cholecystitis" may have its origin in disturbed function resulting from altered emotional stimuli reaching the biliary tract.

The disturbances of the small intestine, which may manifest themselves by rumbling and gurgling, colicky and severe cramplike pains, gaseous disturbance, segmental spasm and rapid motility, have been seen in emotionally disturbed patients. Some of the vitamin imbalances, the iron deficiency anemias and disturbed protein and electrolyte balance may be due to the rapid emptying of the small intestine. This increased motility leaves too little time for complete digestion, absorption and utilization of the dietary intake. Hypothetically many of the deficiency diseases have their origin in this mechanism. The disturbed small bowel gives to the colon partially and incompletely digested food which later alters the physiology of the colon. The colon is compelled to do what it normally should not; the results of this disturbed function may be pain, cramps, diarrhea and even constipation. The colon itself may be the receptor of these altered emotional stimuli. Colitis, often used by the physician as an escape diagnosis, is probably the result of the same mechanism. In the majority of cases pathologic changes cannot be found to explain the symptom complex. Even ulcerative colitis has in many cases associated emotional factors. When psychiatric treatment is given in addition to the medical regimen, improvement is frequently observed.

The problem of duodenal ulcer becomes intensely interesting when studied from this point of view. If psychodynamic factors play a role in the life cycle of ulcer, then the time honored method of treatment may be improved. If the hyperacidity is due to some emotional stimulus, prevention of these stimuli from reaching the duodenal and gastric mucosa is more important than the neutralization of the acidity. However, the hyperirritable gastric glands may be more susceptible to hormonal factors from the small intestine, and hyperacidity may result from this phase of gastric secretion. Therefore, until the irritability of the acid cells is decreased, some neutralization may be necessary to buffer this type of increased acidity. The medical regimen for these patients consists in giving aluminum salts or other neutralizing agents a half hour after the three main meals and atropine sulfate in doses of $\frac{1}{100}$ to $\frac{1}{200}$ grain (0.65 to 0.3 mg.) three times a day at meals and at bedtime. In addition, small doses of phenobarbital at meals and at bedtime in doses of $\frac{1}{4}$ to 1 grain (0.016 to 0.065 Gm.), depending on the therapeutic need. The following diet is suggested:

Avoid:

Coffee, tea, alcohol in all forms, tobacco.
Fried foods, oils, greasy foods, e. g. sardines, salad dressing.
Raw fruits and vegetables.
Whole grain cereal and breads.
Spices and condiments, e. g. mustard, pepper.
Meat, including poultry; meat and meat stock soups.
Sugar, pie, candy, cake, jelly, syrup, honey.

May have items listed—nothing else:

Butter as desired.
Five minute enriched cream of wheat, strained oatmeal and Pettijohns; rice, noodles, macaroni plainly cooked, cornmeal, farina.
Enriched white bread toasted, unsalted white crackers, zwieback, holland rusk, melba toast.
Vegetable milk soups made with puréed vegetables alone; no meat or meat stock to be used.
Lean fresh water fish, e. g. whitefish, perch, trout, bass. To be broiled or boiled alone.
Two eggs daily, either soft boiled or poached.
Cottage and cream cheese in very small portions.
All vegetables to be thoroughly cooked and puréed (as baby foods). Avoid all those with tough fibers and seeds.
Stewed fruit, e. g. prunes, must be puréed. Canned peaches, pears, apricots may be taken whole. All other fruit must be puréed. Juice of strained orange or grapefruit juice daily.
Avoid all syrup of the canned fruit.
Mashed, baked or boiled potatoes are permissible.
Baked custard, rice and tapioca pudding (no raisins), vanilla blanc mange, plain fruit gelatins.
Milk, buttermilk, unsweetened cocoa, small amounts of cream
Only salt to be used in moderate portions.

A sample menu is given in table 1.

The patient with uncomplicated duodenal ulcer responds rapidly to this regimen and is free from symptoms in a relatively short time. Night emptying of the stomach is unnecessary. Complete neutralization of the gastric acidity is not indicated, and many an ulcer will heal promptly under this management. While this management is here given in an abbreviated form, any physician familiar with management of cases of ulcer can fill in the necessary details.

The role played by psychodynamic factors in the life cycle of many patients with ulcer of the duodenum has been well substantiated in recent years. Today it is known that permanent cure of a peptic ulcer patient cannot be secured where the unconscious emotional factors are significant in the clinical picture unless these emotional factors are carefully evaluated and properly

eradicated. The recurrence of peptic ulcer can often be ascribed to the failure of the physician to take these factors at face value. Symptomatic relief due to any medical or surgical procedure is not enough. However, psychoanalytic or psychologic study, be it brief or prolonged, must always be combined with adequate medical control. Only through the pooling of all efforts, somatic and psychologic, can we hope to bring about a permanent cure of these conditions. It is important in this connection not to make unwarranted generalizations. For example, gastric ulcer frequently presents an entirely different therapeutic problem. Carcinomatous ulcer or even the remote malignant transformation of a benign to a malignant ulcer is all too frequent to warrant procrastination. Not even the most competent internist, surgeon, pathologist, roentgenologist or, I might add, gastroscopist can differentiate between a benign and a malignant ulcer in questionable cases. The final diagnosis must rest on the microscopic evidence. Therefore I plead for a great deal of care and circumspection in the conservative care of a chronic gastric ulcer. Until reliable differentiation between benign and malignant ulcer can be made, the surgical approach is preferable to any conservative treatment, medical or psychotherapeutic. The simple, early,

physiology, the prevention of reflex phenomena due to stimulation of various foods, the adequate vitamin and mineral contents and finally rapid return to near normal of body metabolism.

2. If altered emotional stimuli may result from the cortical influence on the midbrain, the medication should be directed at either the eradication or the removal of this influence.

3. If stimulation reaching the gastrointestinal tract by way of the parasympathetic system produces pathologic physiology, therapy should be directed at the site of innervation of these nerves to prevent these altered stimuli from producing these changes.

4. Most important is the philosophic concept of complete approach to this syndrome from the psychosomatic point of view. Simply stated, emotional stimuli produce disturbed function; disturbed function ultimately results in pathologic change. The treatment of pathologic change may be medical or surgical, but the fundamental etiologic approach and prevention of recurrence depends on a study and normalization of the emotional status.

FATIGUE

I have previously reported that emotionally disturbed patients may have fatigue which may result in a disturbance of their carbohydrate metabolism. In a further study of a large number of patients I have found that they uniformly gave a so-called "flat curve" when tested by the intravenous glucose tolerance test (chart 1). Furthermore, an additional group of patients who presented not too flat a curve or were relatively hypoglycemic at the end of the two hours after the injection of intravenous glucose also were fatigued. These patients were submitted to a searching clinical and laboratory investigation. In none were there any organic etiologic factors present which could cause their fatigue.

The fatigue had some striking and almost uniform clinical manifestations. It was usually present on awakening, somewhat relieved by breakfast, usually reappeared in the midafternoon and disappeared after a large dinner. Frequently it was associated with severe early morning headache, more prominently associated at times with midafternoon headache (the kind that is often associated with or thought to be due to eyestrain). There was characteristically a pernicious inertia, even to the extent of continuous bed rest. Hypoglycemic attacks of faintness, vertigo, sweating and extreme weakness often were described. Psychologic investigation revealed a lack of zest and enthusiasm in the few patients critically observed by Dr. Franz Alexander. The sugar level observed could be returned to near normal when the patient was given a dose of atropine sulfate hypodermically, $\frac{1}{50}$ or $\frac{1}{75}$ grain (1.3 or 1 mg.) and the intravenous glucose tolerance test repeated under identical conditions as initially undertaken in the first test (chart 2).

INTRAVENOUS GLUCOSE TOLERANCE TEST

The patient presents himself after a twelve hour fast (no morning bath; no water by mouth except oral hygiene) and is weighed. A fasting blood sugar sample is withdrawn. He is then given the intravenous glucose ($\frac{1}{2}$ Gm. per kilogram of body weight of 50 per cent glucose solution and a large syringe, 50 or 100 cc. type). The time for administration is usually two to five minutes, depending on the age of the patient. Samples of blood are then withdrawn at thirty, sixty, ninety and one hundred and twenty minute intervals after the completion of the initial glucose injection. The blood samples are analyzed according to the Folin-Wu method.

TABLE 1.—Sample Menu for Gastrointestinal Complaints

Breakfast	Lunch	Dinner
3 oz. strained orange juice	4 oz. strained cream of vegetable soup	3 oz. tomato juice
$\frac{1}{2}$ cup farina	2 poached eggs on white toast	3 oz. broiled lake trout
3 oz. milk, cream	1 slice white toast	Small baked potato
Unsweetened coconut	1 pat butter	Purée carrots, 3 oz.
No sugar	Purée spinach	Purée peas, 3 oz.
	Strained applesauce	1 slice white toast
	6 oz. milk	1 pat butter
	No sugar	Canned pear, 3 oz.
		Milk, 6 oz.
		No sugar
Nourishments		
10 a. m.—milk, 6 oz.	3 p. m.—baked custard	9 p. m.—milk, 6 oz.
Bedtime—milk, 6 oz.; buttered toast		
Use saccharin as a substitute for sugar		
Protein, 111; fat, 105; carbohydrate, 223; calories, 2,281		

uncomplicated gastric ulcers that occur frequently in young persons do not necessarily fall into this category. In such cases there is a place for the psychotherapeutic approach under constant medical vigilance.

Duodenal ulcer in its life cycle, its healing and course may be viewed more optimistically; even here when the duodenal ulcer penetrates beneath the mucosa—when it becomes indolent and refractory to medical management—the psychotherapeutic approach does not provide a positive answer. It should not be considered a panacea. Many patients may have to be treated surgically first and only then handed psychotherapeutically to prevent the recurrence or new occurrence of ulcers. The careful, honest evaluation of each case on its merits offers the best possible hope for permanence of cure. One cannot warn too emphatically against making the psychotherapeutic approach a panacea for all patients. Therefore, some medical management should be available which will be helpful not only for the relief of these symptoms but also for placing the patient in a more normal physiologic state, thus preventing untoward emotional stimuli from disturbing the harmonious functioning of the gastrointestinal tract.

SUMMARY

Four basic considerations confront the physician in the medical treatment of these patients:

1. A dietary regimen should be constructed to take into consideration the irritability of the mucous lining of the digestive tract resulting from this pathologic

The results of these values were noted and charted. Attempts were not made to determine the amount of sugar in the urine during the course of this test, because clinical significance did not appear to be attached to such results. Similarly, oral glucose tolerance tests are not of much clinical value because of the uncertainty of the absorption, which frequently leads to false interpretation.

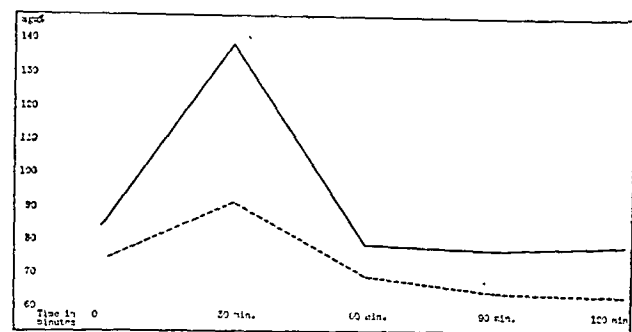


Chart 1.—Intravenous glucose tolerance test: solid line, average normal curve of 30 patients; broken line, average of 55 patients with fatigue.

On the basis of the laboratory data I feel that the fatigue in the patients is due to a relative hypoglycemia, by which I mean that probably these particular individuals have "normal" blood sugar levels which are "hypoglycemic" for their central nervous system.

I do not have physiologic experiments to support my clinical conclusion that this was the only factor in the fatigue. Occasionally the clinician is justified in drawing tentative conclusions from his powers of observation, even though unsupported by colorimetric or other laboratory investigation, particularly when sufficient experimentation has not been done to destroy the validity of the clinical observation. The uniformity of therapeutic results for these patients merits more widespread application of the method and further investigation as to the exact mechanism involved.

In the treatment of these patients diet is important. The diet should be essentially high in protein, moderately high in fat (except in patients with determined pathologic change in the gallbladder, or in those with hyperkinetic dyskinesia of the gallbladder) and relatively high in carbohydrates.

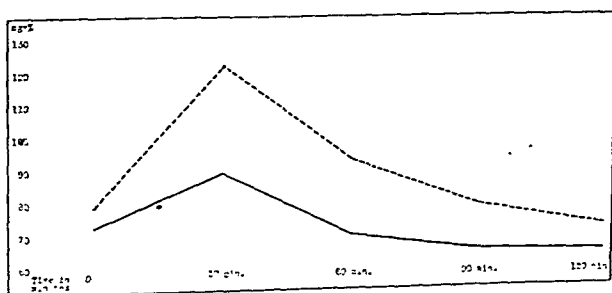


Chart 2.—Intravenous glucose tolerance test: solid line, average curve of 55 patients with fatigue; broken line, average curve of 15 of these patients given 1/50 grain of atropine sulfate hypodermically one-half hour before administration of glucose.

Foods allowed:

Cereals: Any type cooked or dry. Use one serving daily, preferably whole grain cereals.

Breads: Enriched white, whole wheat, light rye; may use melba toast, white crackers, zwieback if desired.

Soups: Vegetable milk soups. Lean meat stock soups.

Meat: Lean meat or fowl. May use crisp boiled bacon at times.

Fish: Lean fresh water fish, e. g. whitefish, perch, trout, bass. To be broiled or boiled. Fresh shrimp and oysters.

Eggs: One daily, either soft, boiled or poached, soft scrambled.

Cheese: Cottage, cream, mild American and mild Swiss in small portions only.

Vegetables: All types cooked and raw are permissible with the exception only of radishes and onions.

Fruits: Fresh, stewed or canned. Use orange or grapefruit at least once daily. Use no syrup of the canned fruit.

Desserts: Baked custard, rice and tapioca pudding, fruit gelatins, cornstarch puddings. Sponge cake, vanilla wafers to be used occasionally, if desired.

Beverages: Milk, buttermilk, tea, coffee, unsweetened breakfast cocoa, cream in small amounts.

Butter: Specified amounts only.

Foods to avoid:

Very fat meat or fish, e. g. sardines, pork, products.

Pie, cake, pastry, candy, sugar, jelly, honey, syrup, alcoholic and carbonated beverages, dried peas and beans, onions, radishes.

A sample menu is given in table 2.

It will be noted that free sugar in any form is omitted. This omission was based on twofold evidence: First, the injection of glucose in normal dogs at a slow rate greatly increases the tolerance of these animals to subsequent more rapid injection; second, the deamination of protein and the formation of carbohydrate go on at a much slower rate in the liver and therefore will give a

TABLE 2.—Sample Menu in Fatigue

Breakfast	Lunch	Dinner
3 oz. orange juice ½ cup oatmeal 3 oz. milk, cream 1 poached egg 1 slice toast 1 pat butter Coffee No sugar	4 oz. cream of vegetable soup 4 oz. broiled lake trout Parsley boiled potato Tossed vegetable salad Lemon juice, salt garnish 1 slice bread 1 pat butter Fresh applesauce 6 oz. milk No sugar	Fresh shrimp cup Broiled lamb chops Small baked potato Asparagus tips Sliced tomatoes 1 t.s.p. dressing 1 slice bread 1 pat butter Fresh strawberries Tea or coffee No sugar
Nourishments		
10 a. m.—milk, 6 oz.	3 p. m.—baked custard	9 p. m.—fresh fruit, crackers
Bedtime—milk, 6 oz.; dry cereal or buttered toast		
Use saccharin as a substitute for sugar		
Protein, 127; fat, 101; carbohydrate, 221; calories, 2,201		

more prolonged secretion of dextrose over a long period, and the postdigestive hypoglycemia of these patients will be delayed if necessary to the next intake of food. However, more frequent feedings than the normal three meals a day were used as an additional factor of safety to prevent hypoglycemia from becoming manifest in these patients. This was further amplified by giving a feeding before retiring to prevent hypoglycemic manifestations (possibly associated with the "night" pains of peptic ulcer) between the last regular meal at night and the subsequent breakfast. The patient receives his three main meals, a midmorning feeding, one or two midafternoon feedings and a feeding before he retires at night.

Too much emphasis cannot be placed on the importance of a good wholesome breakfast. The menus outlined will give sufficient weight to this observation. Too many people rush to their occupations without being fortified with needed calories to do the day's work. This is especially true of women, who seem proud that they eat little, particularly at breakfast, only to have their efficiency proportionally reduced by limitations of diet. Absenteeism is noteworthy among those women workers who go regularly without breakfast. One of the most important functions of food is to give the brain an adequate amount of glucose at all times. Therefore it may be assumed that a possible vicious circle may exist. First starvation, then altered brain

physiology, then altered emotional stimuli, more altered carbohydrate metabolism due to these stimuli and finally the escape mechanism of fatigue.

The rapidity of improvement in patients studied and put on this therapeutic regimen was striking. Furthermore, the small group of patients psychiatrically controlled had an improvement in their psychologic status and a definite reduction of the time during which

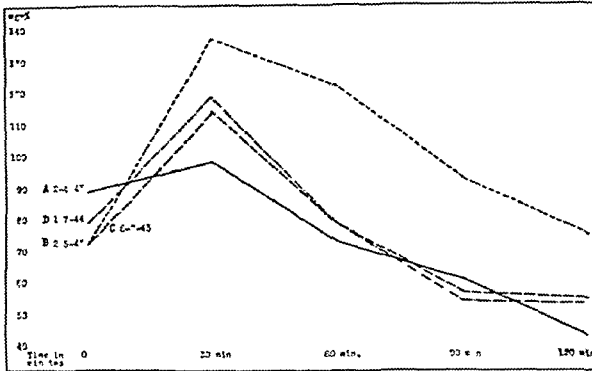


Chart 3—Intravenous glucose tolerance test. A, of a patient suffering from fatigue; B, one half hour after the administration of 1/50 grain of atropine sulfate hypodermically; C, after psychotherapy and medical treatment; D, with no medical treatment and no psychotherapy for seven months

psychotherapy was needed. The psychiatrist is now fortified with a more normal metabolism in the patient, and his task is definitely easier.

Furthermore, at the outset it was evident that dietary management alone would not suffice; that drugs which paralyze the parasympathetic nervous system would be needed to insure that these emotional stimuli would not reach the pancreas. Clinical experimental studies have shown that atropine will raise the blood sugar and if continuously given should and probably does maintain a relatively high level of blood sugar at all times. Therefore, to insure complete atropinization, these patients were given atropine three times a day at meals in doses varying from $\frac{1}{75}$ to $\frac{1}{200}$ grain (1 to 0.3 mg.) and at bedtime from $\frac{1}{150}$ to $\frac{1}{200}$ grain (0.4 to 0.3 mg.). If undue dryness or visual disturbance was noted, the dosage was reduced. Furthermore, extreme care was instituted in giving atropine to elderly patients

As the fatigue improves, the dose of atropine is gradually reduced. Some patients for whom atropine has been discontinued have remained without fatigue (charts 3 and 4). The number of patients in this category are too few to justify any conclusions, and the time is too short to warrant any definite statements. Additional therapeutic measures, such as small doses of phenobarbital during the day and at bedtime and small doses of thiamine hydrochloride at each of the three meals, were uniformly given to these patients.

The charts presented indicate curves of a group of these patients who have had the intravenous glucose tolerance test, the improvement in 2 patients studied psychiatrically and the results of the intravenous tolerance curves when atropine is not given.

I have been particularly impressed by the good clinical results, the ability of these patients to lead a more nearly normal existence, the improvement in the emotional state, the return of zest and enthusiasm, the increased efficiency and finally the possibility of helping out semi-invalidated patients.

However, a note of warning must be issued. The disappearance of the fatigue may stimulate overactivity, and elderly patients must be told to engage in only those

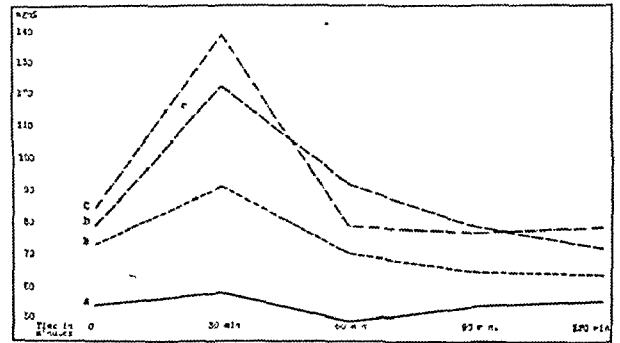


Chart 5—Intravenous glucose tolerance test. A, lowest flat curve of the series; B, average of 55 patients; C, average of 30 normal patients; D, average of 15 patients, given 1/50 grain of atropine hypodermically one half hour before administration of glucose.

activities compatible with their age and the status of their cardiovascular system. This treatment should not be considered a "fountain of youth."

CONCLUSIONS

1. Physicians must survey more critically the emotional status of patients.
2. They should approach with tolerance and insight the problems of a patient whose symptoms indicate emotional factors.
3. Gastrointestinal symptoms are in a majority of instances due to disturbed physiology resulting from altered emotional stimuli.

104 South Michigan Avenue

ABSTRACT OF DISCUSSION

COLONEL LEONARD G. ROWNTREE, M. C., A. U. S.: Now that we realize that peptic ulcer may fall into the realm of psychosomatic disease, we are taking a long step forward. The war itself has brought the clinching proof of the importance of emotionalism in many diseases, particularly peptic ulcer and other visceral diseases. The war has wrought havoc with nerves, more perhaps in the early days when men were torn with uncertainty as to what they should do or had to face, probably more before induction than after induction. Their nerves play havoc with their bodies and with their viscera, and particularly with their minds. There are millions of young men on whose bodies, viscera and minds this emotionalism is having some effect, mild or severe. I believe that understanding in this

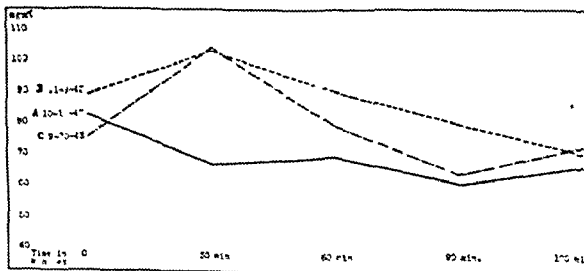


Chart 4—Intravenous glucose tolerance test. A, of a patient suffering from fatigue; B, one half hour after the administration of 1/75 grain of atropine sulfate hypodermically; C, after discontinuance of psychotherapy and medical treatment

because of the precipitation of acute glaucoma, or in those with evident eye disease, for whom atropine was distinctly contraindicated. In only 1 case in over 300 in which atropine was used for the fatigue or other psychosomatic disturbances was an allergy noted to the drug. Recent experience with syntropan indicates that it may have a similar therapeutic application, but up to the present good results have not been as uniform as those seen with the use of atropine.

field is one of the crucial needs for the improvement of medical care. I particularly like Dr. Portis's second conclusion, "that a physician should approach with tolerance and insight the problems of patients whose symptoms indicate emotionalism." Emotionalism is nothing of which to be ashamed. All who are worth while have emotionalism. Fear is nothing of which to be ashamed. If we could bring to the young men of this nation the concept and the fact that fear is normal, that it is a part of a protective mechanism and that so long as it is properly controlled it is beneficent and not anything of which to be ashamed, we would accomplish much. This would do a great deal to help the problem of psychoneurosis. Dr. Portis's insistence on the role of fatigue is also correct. Fatigue is rampant throughout the nation. It is much more rampant among those who are emotional.

DR. HOBART A. REIMANN, Philadelphia: I am in complete agreement with Dr. Portis as to the great importance of considering the patient's emotional status or reaction in relation to the disease or complaints from which he suffers. This, in brief, encompasses the field to which the euphonious fashionable name psychosomatic medicine has been given: the management of certain gastrointestinal disturbances as outlined by Dr. Portis with psychotherapy, diet and medication is indeed the treatment of choice for the conditions mentioned. But one must attempt to differentiate whether the emotional disturbance is the apparent direct cause of organic disease, as it may be in peptic ulcer or ulcerative colitis, or whether the organic disease is primary and merely complicates, aggravates or incites emotional disturbance. Dr. Portis's treatment is, of course, useful in either circumstance. Besides, the recognition of underlying difficulties, if they are psychic, will serve to prevent many unnecessary surgical operations. It is not clear whether the fatigue disturbs the carbohydrate metabolism or is caused by hypoglycemia. It is so to confuse cause with effect. Atropine seems to be helpful, as stated, but I suspect that the type of patient discussed could be included under the term vagotonia in the sense used by Eppinger and Hess. If this is the case, hypoglycemia is usually only one of many other evidences of imbalance all of which perhaps require management. It reminds me of a case I often cite for discussion. A man of 54 was a painter with a multitude of complaints. He had persistently subnormal temperature, a bradycardia of 50, a blood pressure of 90/60, and a basal metabolic rate of minus 20. He was treated by various physicians in turn for lead poisoning because he was a painter, for bradycardia, for hypotension and for hypothyroidism, when in fact each of the measurable abnormalities was part and parcel of his general makeup. Furthermore, the type of patient under discussion may be relieved of various complaints referable to one system only to have them shift to another, so that these patients should not be referred particularly to gastroenterologists, cardiologists and other specialists according to their predominant symptoms. There is evidence that shift of this type has occurred *en masse*. According to reports, peptic ulcer is of great importance in the Army at present, so much so that in this war as compared with the last "soldier's stomach" seems to have replaced "soldier's heart" in frequency or in fashion.

DR. STONEY A. PORTIS, Chicago: I would like to reemphasize that when we exclude carcinoma, neoplastic disease, parasitic and bacterial infections, metabolic disease and intoxications we must have a logical explanation for the symptoms of which the patient complains. The medical schools are noticeably lax in their discussion of pathologic physiology as it relates to man, and for the most part physiology is taught from observations on dogs. It is this approach to the problem which I have tried to emphasize. I am not willing to admit that all peptic ulcer is of psychosomatic origin, but I think the greater percentage of these ulcers are associated with a problem due to emotional disturbances. No one needs a better example than the occurrence of a large number of peptic ulcers in our 18, 19 and 20 year old soldiers. This group offers excellent opportunities for

studying the incidence of ulcers associated with emotional disturbances. Certainly no one could say that these soldiers have been exposed to the ravages of life, and one can only conclude that peptic ulcer is an organ language for emotional disturbance. We as physicians must be fully prepared to solve these postwar medical problems. The army has to be prepared with enough insight to handle this situation, or the veterans' bill following World War II will be stupendous. Dr. Reimann raised the question whether or not slight deviations from normal in blood sugar could cause the symptoms which were outlined. It seems to me that we shall have to change our ideas on the clinical significance of blood sugar levels. Formerly we would talk only about hypoglycemia in terms of 30 or 40 mg. per hundred cubic centimeters. This work has shown that deviations of 5 or 10 or 15 mg. per hundred cubic centimeters make the difference between fatigue and normal energy. The rapidity of response of the patients to the management outlined was so striking that I think this conclusion justified. Finally we, as physicians, must be exceedingly tolerant, gain insight into the problems of the patient and help him over that hump over which he has no conscious control, namely his disturbed emotional system.

COMBINED PENICILLIN AND SULFONAMIDE THERAPY

IN THE TREATMENT OF PNEUMOCOCCIC
MENINGITIS

ANTONIO J. WARING JR., M.D.

AND

MARGARET H. D. SMITH, M.D.

BALTIMORE

Before the advent of chemotherapy, pneumococcic meningitis was an almost invariably fatal disease. Recoveries were rare. The mortality was greater than 99 per cent. In 1927 a review of the literature revealed only 150 recoveries.¹ With the appearance of the sulfonamides the mortality rate for the first time seemed less forbidding, varying, according to different authors, from 31 per cent to 80 per cent.²

Since 1937 the use of type specific antipneumococcic rabbit serum in conjunction with sulfonamide therapy (sulfapyridine, sulfathiazole, sulfadiazine, sulfapyrazine and sulfamerazine) has come into fashion. There again reports of the comparative advantages of combined serum and sulfonamide therapy as opposed to sulfonamides alone are somewhat equivocal. Certainly the advantages of combined therapy are not particularly striking, and in many cases the overzealous use of serum may be actually deleterious. The use of intrathecal serum, for example, is probably ill advised, as is the pushing of intravenous serum to high levels after an adequate reaction is obtained with the patient's own serum. In most instances it is noted that the mortality seems somewhat lower in the group of patients given combined therapy, and therefore the use of serum with sulfonamide therapy is probably justified if not carried to excess.

From the Department of Pediatrics, Johns Hopkins University, 611 Harriet Lane Home, Johns Hopkins Hospital and Sydenham Hospital, Baltimore City Health Department.

1. Goldstein, H. Z., and Goldstein, H. I.: Review of Literature on Pneumococcus Meningitis, *Internat. Clin.* 2:155 (Sept.) 1927.
2. Steele, C. W., and Gutlieb, J.: Treatment of Pneumococcus Meningitis with Sulfonamides and Sulfapyridine: A Statistical Study of Reported Cases in Which Chemotherapy Was Used, *Wash. J. Med.* 1941. Specific Antipneumococcus Serum, *Arch. Int. Med.* 69:211 (May) 1941. Hodges, Gilbert and Bennett: *Hodges, Smith and Jones*.

Since this paper represents the most recent experience at the Harriet Lane Home and Sydenham Hospital, Baltimore, it is felt worth while to recapitulate the past results in these clinics in the treatment of pneumococcic meningitis, most of which have been published. Between 1930 and 1936, 29 cases were seen at Sydenham. No therapy other than supportive was used. The mortality was 100 per cent. The comparable series in the Harriet Lane Home (August 1912 to January 1937) consisted of 150 cases. These received the usual treatment of stimulants, transfusions and spinal drainage. There was not a single recovery in this entire series.

From December 1936 to October 1938, 17 patients at Sydenham Hospital were treated with sulfanilamide with 1 recovery. The experience at the Harriet Lane Home was similar: 8 patients were treated with 1 recovery, and that patient developed a severe myelitis with permanent damage. In October 1938 sulfapyridine and its sodium salt became available. In 1939 Hodes, Gimbel and Burnett³ reported a series of 17 cases treated with sulfapyridine with recovery of 8 patients. Since then 43 additional cases (Sydenham Hospital and the Harriet Lane Home) have been reported by one of us.⁴ Therapy consisted both of sulfonamide alone (sulfapyridine, sulfadiazine and sulfathiazole) and of serum and sulfonamide combined. Sulfonamide levels of 8.0 to 12.0 mg. per hundred cubic centimeters were obtained, and serum was given intra-

TABLE 1.—Recoveries by Ages

	Number of Cases	Recovered	Percentage Recovered
Under 2 years.....	32	7	22
Over 2 years.....	28	18	64
Total	60	25	42

venously until the patient's serum produced a definite capsular swelling with the patient's own pneumococcus in a dilution of 1:5. The results of experience with pneumococcic meningitis in these clinics are summarized in table 1.

Thus there is striking difference in recovery rate according to the age of the patient. Only 22 per cent of those under 2 years of age recovered, in contrast to 64 per cent of those over 2.

Between January 1943 and November 1943, when the present series of 12 consecutive cases started, no single therapeutic regimen was followed. Some patients were treated with sulfonamide and serum; others, since February 1943, have been treated with penicillin alone. It is difficult to evaluate the results in this group. In the Harriet Lane Home 10 cases were treated in this interval with only 3 survivals. The survivals were all of children treated with sulfonamide and serum. The experience at Sydenham Hospital was similar. Penicillin alone seemed capable of curing the disease only in a small percentage of cases. In other cases it was our impression that it served to check the course of the disease for a space of time but was unable to arrest it completely despite vigorous intrathecal and intramuscular therapy. Recently 21 cases of pneumococcic meningitis treated with penicillin alone were reported to the National Research Council;

of these 21 patients, only 7 recovered. On the other hand, several instances of recovery have been reported following combined sulfonamide and penicillin therapy.⁵

At the time the present series started, we hoped to obtain a clear evaluation of the role of penicillin in the treatment of pneumococcic meningitis. During November 1943 we had in the wards in the Harriet Lane Home a 5 months old Negro infant who died after a forty-four day illness. The patient had received penicillin in high doses intrathecally and intramuscularly for two weeks. Spinal fluid cultures became negative early in the course, but, because of persistent fever and leukocytosis, penicillin was continued. It was later found that the child, having recovered from the pneumococcic infection, had developed an Aerobacter aerogenes meningitis secondary to a cellulitis of the back, and the child died despite sulfadiazine therapy. Autopsy revealed a chronic basilar meningitis and obstruction of the forams of Luschka and Magendie with pronounced hydrocephalus. In retrospect we should probably have discontinued intrathecal penicillin on the seventh or eighth day. The infection was obviously carried intrathecally by a lumbar puncture through the area of cellulitis.

With this result still fresh in mind, we were confronted with 3 cases of pneumococcic meningitis simultaneously in early January. Patient 1 had been in the ward since mid-November and patient 2 since the end of December. Patient 3 was a new arrival and had been under treatment for five days. Our policy at that time was to treat the disease first with a course of penicillin intrathecally and intramuscularly in essentially the doses about to be outlined. After a seven to ten day trial, if the result seemed discouraging, we proposed to change from penicillin to combined use of sulfonamide and serum. Patient 1 was a 4 months old infant who had been treated for six days with penicillin without results. Penicillin was discontinued and the child was started on sulfapyrazine and serum combined. This form of therapy was used for almost four weeks. During the greater part of the time the child seemed neither better nor worse, but spinal fluid cultures remained persistently positive. Suddenly, in the middle of her fifth hospital week, the patient's condition began to deteriorate rapidly; the temperature rose, the child became stuporous and developed convulsions. At this point the blood sulfapyrazine level was 14.0 mg. per hundred cubic centimeters and the patient's serum showed a positive quellung reaction with its own pneumococcus in a dilution of 1:8. It was decided to try a last course of penicillin before abandoning therapy. The child showed an immediate response; the temperature fell, the clinical appearance improved rapidly and the spinal fluid cultures, which had been persistently positive for five weeks, became negative in twenty-four hours and remained so throughout the course. The convalescence was uneventful with no residual damage except for a spastic monoplegia of one arm.

The likeliest explanation seemed to be that for a period of forty-eight hours at least the child was getting intensive combined therapy with a high sulfonamide level, good quellung reaction and adequate penicillin therapy. At this time patient 2, a 15 months

3. Hodes, H. L.; Gimbel, H. S., and Burnett, G. W.: Treatment of Pneumococcic Meningitis with Sulfapyridine and the Sodium Salt of Sulfapyridine, *J. A. M. A.* 123: 1614 (Oct. 28) 1939.
4. Hodes, H. L.; Smith, M. H. D., and Ickes, H. J.: Sixty Cases of Pneumococcic Meningitis Treated with Sulfonamides, *J. A. M. A.* 121: 1334 (April 24) 1943.

5. Dawson, M. H., and Hebbly, G. L.: The Clinical Use of Penicillin, *J. A. M. A.* 124: 611 (March 4) 1944. Barler, L. F.: Gradenigo Syndrome Complicated by Pneumococcal Meningitis: Recovery After Intensive Treatment with Penicillin and Sulfadiazine, *Am. J. M. Sc.* 206: 701 (Dec.) 1943. Tillett, W. S.: Paper read before the Society of American Bacteriologists, New York City in May 1944.

old white boy, had been on intensive penicillin therapy for almost fourteen days and his condition had suddenly grown worse, the temperature had risen, spinal fluid cultures were positive and the child was becoming increasingly drowsy. At the same time patient 3 had been on penicillin for a period of five days, the tem-

time. Subsequently 1.0 Gm. every four hours is given. Blood levels are determined daily, and the dosage is manipulated in such a manner as to assure the maintenance of a blood concentration between 6.0 and 12.0 mg. per hundred cubic centimeters. Actually, levels over 4.0 mg. per hundred cubic centimeters are probably effective, and it has been our own experience that no advantage is achieved by obtaining levels higher than 12.0 mg. per hundred cubic centimeters. The only drug reactions encountered were both in adults and consisted of drug fever.

Penicillin Therapy.—Intramuscular and intrathecal penicillin is started as soon as the diagnosis is established. There is no regular dosage system for this agent, but the following general rules are observed: Infants and small children receive daily 5,000 to 10,000 Oxford units intrathecally. During the first two to three days of treatment this is given twice daily in doses of 2,500 to 5,000 Oxford units. Thereafter a single intrathecal injection of 2,500 to 5,000 units is given daily. Infants and small children also receive 1,500 to 2,500 units intramuscularly every three hours day and night, a total of 12,000 to 20,000 units daily. Older children and adults receive 10,000 to 20,000 units intrathecally daily and 5,000 to 10,000 units intramuscularly every three hours day and night.

The penicillin is prepared for intrathecal injections by taking up the required dose in 5 cc. of sterile isotonic solution of sodium chloride. A lumbar puncture needle is inserted into the spinal canal and approximately 5 cc. of spinal fluid allowed to drip out into the sterile container. The penicillin is then slowly injected by

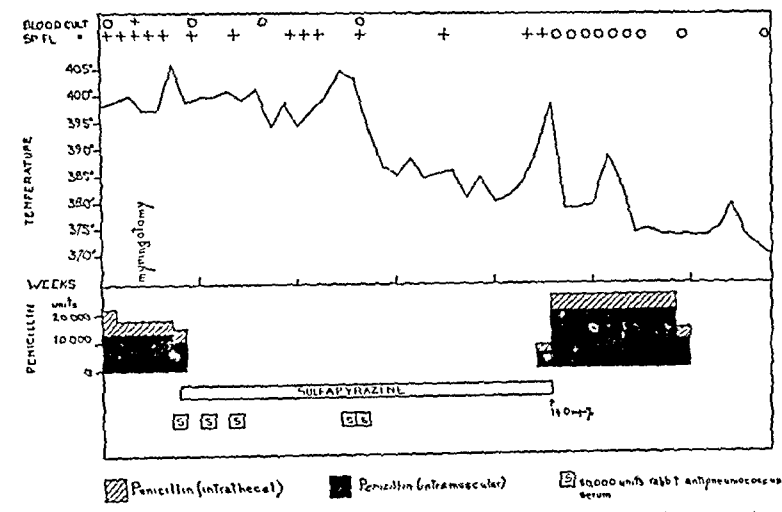


Chart 1.—Results of treatment of a 4 months old white girl with meningitis (pneumococcus type VI) showing prompt response to combined penicillin and sulfonamide therapy after failure of penicillin alone and combined sulfonamide and type specific serum.

perature was remaining high, cultures were positive and the child was still drowsy. It was felt that penicillin alone was failing to cure those cases. Accordingly, sulfonamide and penicillin were used simultaneously.⁶ Spinal fluid cultures of patient 3 became negative, and, except for a period of unexplained fever, recovery was uneventful. Combined therapy of patient 2 was halted prematurely and a cellulitis of the back developed. The meningitis recurred, but the patient recovered when combined therapy was reinstituted.

Charts 3, 4 and 5 demonstrate the effectiveness of combined penicillin and sulfonamide therapy when instituted early in the course of the disease.

TREATMENT

We now proceed as follows as soon as the diagnosis of pneumococcal meningitis is established:

We do not feel that any one sulfonamide presents particular advantages over the others; sulfadiazine and sulfapyrazine are usually used for our patients. The initial dose in most instances is given intravenously in the form of the sodium salt, which for children is 0.05 Gm. of the sodium salt per kilogram of body weight, freshly made up in a 5 per cent solution with distilled water. At the same time the patient receives 0.1 Gm. per kilogram of body weight by mouth or, if unconscious, by stomach tube. From then on approximately 0.2 Gm. per kilogram of body weight is given in six divided doses during each twenty-four hour period. Adults receive initially 3.0 Gm. intravenously and 2.0 to 4.0 Gm. by mouth at the same

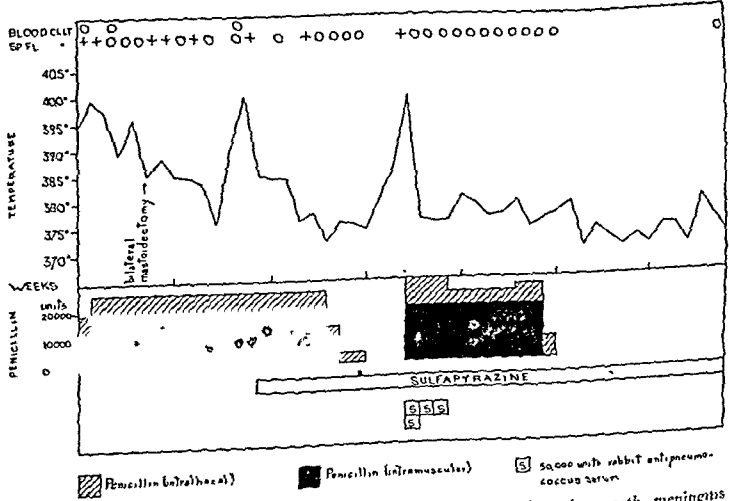


Chart 2.—Results of treatment of a 15 months old white boy with meningitis (pneumococcus type XVI) which failed to respond to adequate penicillin therapy but apparently responded to combined penicillin and sulfonamide therapy. Spinal fluid cultures again became positive when penicillin was discontinued prematurely, but when combined therapy was reinstituted there was a prompt response with recovery.

syringe into the spinal canal. Particular care is taken to avoid going into the same interspace twice in succession; the three upper lumbar spaces are used in rotation. Whenever possible, treatments are performed by the same individual; rigorous sterile technic is always employed, the operator preferably wearing rubber gloves.

6. The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigations recommended by the Committee on Chemotherapeutics and Other Agents of the National Research Council.

Ill effects were few. One patient, who had had numerous lumbar punctures before combined therapy was instituted, developed a cellulitis of the back. The adult patients complained in several instances of headache and nausea following intrathecal injections. This type of reaction had previously been noted by Rammelkamp and Keefer.⁷ Our patients did not show definite pleocytosis. One complication should be mentioned, however, which may have been secondary to intrathecal penicillin. A 2 months old infant (patient 10) received 20,000 units of penicillin intrathecally in a single injection. The child had been sick only twenty-four hours at the time treatment was begun. She had a negative spinal fluid culture after twenty-four hours of treatment and otherwise underwent an uneventful recovery. Unfortunately she developed optic atrophy and was discharged totally blind. This occurrence may bear no relationship to the intrathecal dose of penicillin, but it should give us pause before injecting unnecessarily large amounts of penicillin into the spinal canal.

The general rule which has evolved for the maintenance of combined therapy is that treatment be continued for at least six days following the last positive

the acute phase of the illness has passed. Since we have been using combined therapy the question of mastoidectomy has not arisen.

Other Forms of Treatment.—General supportive measures are used as indicated. Fluids are forced by mouth and gavage. If vomiting is a prominent feature

the fluid complement is maintained through intravenous or subcutaneous routes. In the face of high fever or collapse, continuous intravenous infusion is employed and blood plasma, 10 per cent glucose, 5 per cent glucose and isotonic solutions of sodium chloride are given as indicated. For infants we use 0.45 per cent in preference to isotonic solution of sodium chloride. If possible, the needle (ranging anywhere from a size 25 to

19) is taped into a scalp, wrist, arm or ankle vein. In the case of infants, if no such vein is available, a cannula is tied into the saphenous vein at the ankle. We have found that a cut off lumbar puncture needle (size 19 or 20) serves very well. When fluids are discontinued at any time, the stylet, which is kept sterile at the bedside, may be inserted. The needle and vein remain patent for periods of six to eight hours, and fluids may be resumed at will. The only necessary procedure before the resumption of fluids is

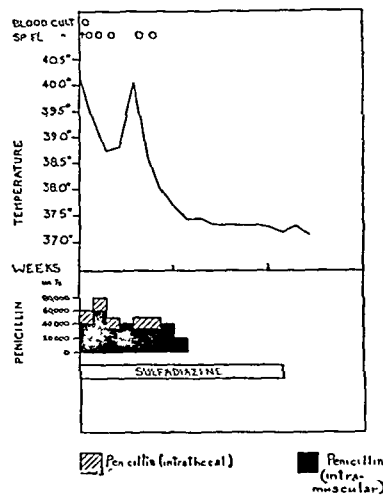


Chart 4.—Results of early treatment of a 7 year old white girl with meningitis (pneumococcus type III), showing prompt response to combined penicillin and sulfonamide therapy.

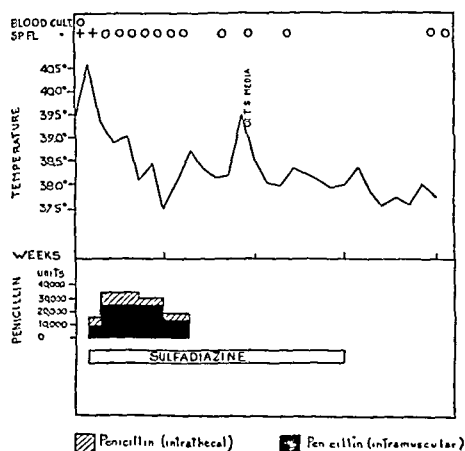


Chart 3.—Results of treatment of a 16 months old white girl with meningitis (pneumococcus type XII) whose treatment was instituted early in the course of the disease, showing prompt response to combined penicillin and sulfonamide therapy.

spinal fluid culture. After this period has elapsed penicillin is withdrawn, but the sulfonamide is continued for an additional seven to fourteen days. After the sulfonamide has been discontinued the patient is kept in the hospital for at least a week with no specific treatment at all.

Serum.—Type specific antipneumococcal rabbit serum was employed in 4 of our 12 cases. The methods used were essentially those outlined by Hodes, Smith and Ickes.⁴ It was used in cases early in our series when we were unsure of our scheme of treatment and any minor reversal seemed an indication for its use. In the light of subsequent experience we feel that, in all probability, it contributed little to the ultimate recovery of our patients. Intravenous serum should be kept in mind, however, as an additional procedure in cases of relapse despite adequate combined therapy.

Operative Procedures.—Unless there is obvious need for surgical drainage of a sinus or a mastoid, it is felt that these procedures should be avoided. Myringotomy is performed freely as indicated. In any event it is our present policy to defer any surgical procedure until

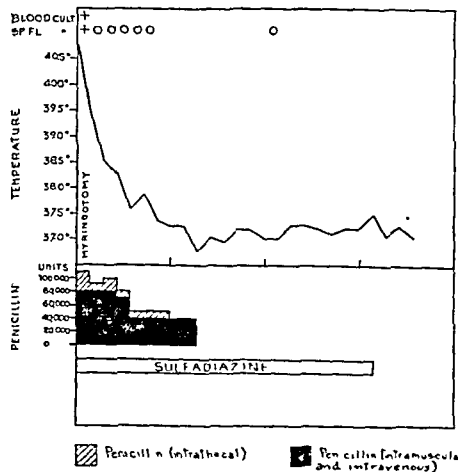


Chart 5.—Results of early treatment of a 40 year old white man with meningitis (pneumococcus type III), showing prompt response to combined sulfonamide and penicillin therapy.

that 10 to 15 cc. of isotonic solution of sodium chloride be forced through the cannula with a syringe. The use of the cannula and stylet has many advantages with small infants and those having precarious circulations.

Sedation is often necessary. We use paraldehyde, either by gavage or by intramuscular injection, and avoid the use of the barbiturates, codeine and morphine.

7. Rammelkamp, C. H., and Keefer, C. S.—Absorption, Excretion and Toxicity of Penicillin Administered by Intrathecal Injection. *Am. J. M. Sc.* 205: 342 (March) 1943.

RESULTS

In 12 consecutive cases of pneumococcic meningitis combined use of sulfonamide and penicillin was employed. Eight of the patients were infants ranging from 2 to 16 months of age. One was a child of 7 years. The remaining 3 were adults. The majority of the cases were seen early in the disease, 9 within the first forty-eight hours, 3 within the first seventy-two hours.

Foci of infection other than the meninges were common, and in all cases the same pneumococcus found in the spinal fluid was present elsewhere in the body. In 6 instances the meningeal signs were either accom-

panied by the pneumococcus was isolated from the nasopharynx.

In all cases the pneumococcus was cultured from the spinal fluid. In 7 cases the same organism was found in the blood stream.

The spinal fluid was cultured at the time of each intrathecal treatment, and spinal fluid sugar and protein determinations were made at regular intervals. These values were of some aid in following the course of the disease, but the correlation between the clinical and bacteriologic progress and the protein and sugar levels was variable.

TABLE 2.—Results in 12 Cases of Pneumococcic Meningitis Treated with Combined Penicillin and Sulfonamide

Case No.	Name, Age, Color, Sex	Condition on Admission	Spinal Fluid Findings	Previous Therapy	Combined Therapy	Spinal Fluid Sterile After Combined Therapy (Days)	Duration of Combined Therapy	Outcome
1	J. A. H. 4 mo. W. ♀	Stuporous; convulsions; T. 39.8 C.	Pneumococcus VII, 800 polys	Sulfathiazole 3 days; penicillin 6 days; sulfadiazine and serum 27 days	Sulfadiazine; penicillin 5,000 units intrathecally q. d. and 1,500 units intramuscularly q. 2 h.	2	2 days	Recovered (spastic paralysis, right arm)
2	J. McM. 15 mo. W. ♂	Ophthalmitis; pneumonia; otitis; T. 38.4 C.; B. P. 30/0	Pneumococcus XVI, 2,150 polys	Penicillin 6,000 units intrathecally q. d. and 2,500 units intramuscularly q. 3 h. for 14 days	Sulfapyrazine; penicillin 6,000 to 10,000 units intrathecally q. d. and type specific rabbit serum 100,000 units	12	1st course 8 days, 2d course 11 days	Recovered (partial paralysis; 1/2 total deafness)
3	B. L. 8 mo. W. ♂	Stuporous; convulsions; otitis; T. 40.0 C.	Pneumococcus XIX, 6,900 polys	Penicillin 6,000 units intrathecally q. d. and 2,000 intramuscularly q. 3 h. for 5 days	Sulfapyrazine; penicillin 6,000 units intrathecally q. d. and 2,500 units intramuscularly q. 3 h.; type specific rabbit serum 90,000 units	3	8 days	Recovered
4	R. M. S. 16 mo. W. ♀	Irritable; drowsy; T. 39.0 C.	Pneumococcus XII, 415 polys	0	Sulfadiazine; penicillin 20,000 units intrathecally q. d. and 2,000 intramuscularly q. 3 h.	2	8 days	Recovered
5	S. W. 52 yr. C. ♂	Comatose; disoriented; T. 39.8 C.	Pneumococcus XXXVI, 3,750 polys	0	Sulfadiazine intrathecally	2	4 days	Recovered
6	N. S. 7 yr. W. ♀	Moderately ill; otitis media; T. 40.0 C.	Pneumococcus III, 6,000 polys	Sulfonamide 2 days	Sulfadiazine; penicillin 10,000 units intrathecally b. d. and 10,000 units intramuscularly q. 3 h.	1	8 days	Recovered
7	L. M. 9 mo. C. ♂	Pertussis; pneumonia; convulsions; otitis; T. 41.0 C.	Pneumococcus XIV, 2,000 lymphocytes	Sulfadiazine 2 days	Sulfadiazine, later sulfapyrazine; penicillin 5,000 to 10,000 units intrathecally b. d. and 2,500 to 5,000 units intramuscularly q. 3 h.; type specific rabbit serum 200,000 units	12	18 days	Recovered
8	H. G. 40 yr. W. ♂	Seriously ill; drowsy; otitis; T. 41.0 C.	Pneumococcus I, 650 polys	Sulfonamide 2 weeks (irregularly)	Sulfadiazine; penicillin 5,000 to 10,000 units intrathecally b. d. and 5,000 to 10,000 units intramuscularly q. 3 h.	2	9 days	Recovered
9	R. G. 2 mo. W. ♂	Moribund; petechiae; shock; T. 38.4 C.	Pneumococcus XII, 400 polys	0	Penicillin	..	.....	Died in less than 24 hours
10	M. D. 3 mo. W. ♀	Moderately ill; purulent conjunctivitis; T. 40.0 C.	Pneumococcus XXIX, 6,000 polys	0	Sulfadiazine, later sulfamerazine; penicillin 5,000 to 20,000 units intrathecally q. d. and 2,500 units intramuscularly q. 3 h.	2	16 days	Recovered* (blindness)
11	M. A. 52 yr. C. ♀	Moderately ill; pneumonia; T. 39.4 C.	Pneumococcus XII, 4,800 polys	Sulfonamide 3 days	Sulfadiazine; penicillin 10,000 units intrathecally q. d. and 5,000 units intramuscularly q. 3 h.	5	11 days	Recovered
12	N. L. 6 mo. C. ♂	Moderately ill; dehydrated; otitis; T. 38.5 C.	Pneumococcus XXXIII, 4,800 polys	0	Sulfadiazine; penicillin 2,500 to 5,000 units intrathecally and 2,500 units intramuscularly q. 3 h.	2	9 days	Recovered

* This patient was treated at the Union Memorial Hospital, and permission to report the case was given us by Dr. D. C. Wharton Smith and his staff.

panied or preceded by purulent otitis media, and the offending pneumococcus was isolated from the ear and nasopharynx. Three cases were complicated by pneumonia at the time of admission. In one patient, a 9 months old Negro boy, the pneumonia itself was a complication of pertussis. In another patient, a 3 months old white girl, the original source of the organism appeared to have been a conjunctivitis. A history of preceding trauma was obtained in only 1 instance, a 52 year old Negro man who had been struck on the head two days prior to admission and had bled from the ear. No fracture of the skull was demonstrable. In 1 case the only infection noted was a pharyngitis,

Previous treatment of one sort or another had been employed in 7 cases. Four patients received sulfonamide for forty-eight to seventy-two hours before combined therapy began. Three patients had received intrathecal and intravenous penicillin in adequate dosage for periods of five, six and fourteen days respectively. One patient had had penicillin for six days and sulfadiazine and serum for twenty-seven days. In all cases, despite previous treatment, the spinal fluid cultures were positive at the beginning of combined therapy.

The average duration of combined treatment was 10.2 days, the shortest being an estimated forty-eight hours, the longest eighteen days. The latter was in

the case of a relapse, however. Spinal fluid cultures became permanently negative in an average of 4.1 days, but the general average is increased by the 2 cases in which relapse occurred and in each of which the spinal fluid became negative on the twelfth day. In 7 cases the spinal fluid culture had become negative by the time the second therapeutic lumbar puncture was performed. Combined therapy was maintained in most instances from five to seven days after the spinal fluid had become negative.

Sulfonamide was usually continued after the penicillin was stopped, but in the 2 patients who developed drug fever the penicillin was continued when the sulfonamide therapy had to be terminated.

Recurrences were observed in 2 cases. In 1 of these (patient 2) therapy was stopped early because of cellulitis of the back. In the other (patient 7) the penicillin dosage was reduced on the third day of treatment. Both patients had a protracted course.

The only death in this series occurred within ten hours of the patient's admission. Patient 9 was a 2 months old white boy who was admitted in collapse, covered with petechiae and breathing in short, spasmodic gasps; the blood pressure was unobtainable. Shortly after admission the child developed acute dilatation of the stomach and began to vomit changed blood. He was treated with gastric lavage, intravenous saline solution, 50 per cent glucose, blood and adrenal cortex extract and also received initial doses of penicillin and sulfadiazine. The blood pressure rose for a while, but the child again went into circulatory collapse and died ten hours after admission.

Thus there were 11 recoveries and 1 death within ten hours of admission. The death occurred too quickly to be a fair test of any form of therapy. Residua, consisting of a spastic monoplegia and bilateral nerve deafness, occurred in 2 cases. In both of these the meningitis had been active for thirty-six days and seventeen days respectively before combined therapy was started. Patient 10 developed optic atrophy. As

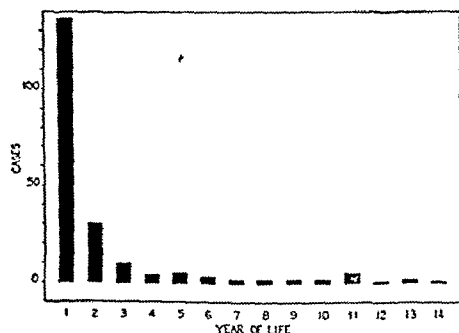


Chart 6.—Age incidence of pneumococcal meningitis during the first fourteen years of life: 206 cases (Harriet Lane Home, August 1912-July 1944). First year of life 137 cases, second year 30, third year 10, fourth year 4, fifth year 5, sixth year 3, seventh year 2, eighth year 2, ninth year 2, tenth year 2, eleventh year 5, twelfth year 1, thirteenth year 2 and fourteenth year 1.

mentioned earlier, this may possibly be due to excessive intrathecal dosage of penicillin. In all cases the general performance level seemed unimpaired.

AGE INCIDENCE

As has been pointed out earlier in this paper, the mortality in pneumococcal meningitis is particularly high in infants. In order to determine whether the present 12 cases form a representative group with regard to age, a study was made of the age incidence

of pneumococcal meningitis in the pediatric age group (0-14 years) based on the Harriet Lane Home records over a period of thirty-two years (August 1912 to July 1944). The figures are tabulated in chart 6; we feel, on the basis of this chart, that the 12 cases in our present series represent a fair sampling.

A total of 206 cases are presented. Of these, 137 (66.4 per cent) occurred during the first year of life. Thirty (14.5 per cent) occurred during the second year of life. The remainder were scattered fairly uniformly over the following twelve years. Thus 80.9 per cent of all the cases admitted to Harriet Lane Home fell in the age group in which the mortality has been demonstrated to be 78 per cent with the best of serum and sulfonamide therapy.

When the 167 cases occurring during the first two years of life are broken down into three month intervals, an interesting curve is obtained (chart 7). The incidence is high during the first three months, rises to a peak at about the sixth month of life and then begins to fall off abruptly.

Six cases occurred in very young infants. The youngest was in an infant 5 days old. One occurred at 2 weeks, another at 3 weeks. Three cases occurred at 1 month of age. There were no recoveries in this group.

COMMENT

In the light of the age incidence of pneumococcal meningitis and the difference in mortality according to age group, it will be noted that the present series has a representative age distribution. Eight of our 12 cases fall under 2 years of age. With serum and sulfonamide therapy we could have expected to lose 6 or 7 of these 8 infants. Under penicillin and sulfonamide therapy we lost 1. All 4 older patients recovered. Under the old form of therapy we would have expected to lose 1.

The pneumococcus types isolated from these 12 cases were in most instances different. Type XII was recovered three times. Other than this there was no reduplication of type.

Case 4 was of interest in that the meningitis occurred in a child that had been followed in the Harriet Lane Dispensary as a proved case of toxoplasma encephalitis. There was no other patient with a previous history of central nervous system disease.

The question of mastoidectomy often comes up in the younger age group. Two thirds of our patients are infants, and most have otitis media. We feel that during the first two years of life the mastoid cells are more or less involved in all cases of otitis media. While the mastoids and middle ear may well be the source of the bacteremia or septicemia responsible for the meningeal infection, direct extension from the mastoid is probably rare and usually cannot be demonstrated at postmortem examination. Mastoidectomies were performed in 2 of our cases, but that was before the present

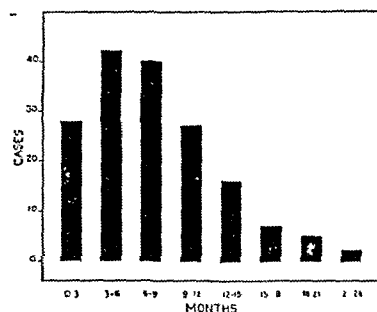


Chart 7.—Age incidence of pneumococcal meningitis during the first twenty-four months of life: 167 cases (Harriet Lane Home, August 1912 to July 1944). 0-3 months 28 cases, 3-6 months 42 cases, 6-9 months 40 cases, 9-12 months 27 cases, 12-15 months 16 cases, 15-18 months 10 cases, 18-21 months 7 cases, 21-24 months 5 cases.

system of combined therapy was begun. We feel that the procedure is rarely justified.

Twelve cases form too short a series for statistical analysis, but our experience suggests that combined use of sulfonamide and penicillin gives results which are not obtained by the use of either agent alone or by the use of combined sulfonamide and serum.

SUMMARY

1. Twelve patients with pneumococcic meningitis were treated with combined sulfonamide and penicillin therapy.⁸

2. Of these 12 patients, 11 recovered and 1 died. Death occurred within ten hours of admission. Three had previously failed to respond to penicillin therapy alone.

3. These results are better than our experience with sulfonamide alone, with sulfonamide and serum combined or with penicillin alone.

4. Two hundred and seven cases of pneumococcic meningitis admitted to Harriet Lane Home (August 1912 to July 1944) were analyzed on the basis of age incidence and the data presented in chart form, demonstrating (a) the high incidence of this infection during the first year of life and (b) the fact that our 12 recent cases represent a fair sampling with regard to age.

5. If combined sulfonamide and penicillin therapy is used, particular pains must be taken to pursue both forms of treatment vigorously as well as simultaneously.⁹

EFFECTS OF TETRYL

MAJOR E. W. PROBST

MEDICAL CORPS, ARMY OF THE UNITED STATES

LIEUTENANT M. H. MUND

MEDICAL CORPS, ARMY OF THE UNITED STATES

AND

L. D. LEWIS, B.S., M.T. (ASCP)

DOYLR, N. J.

Since the literature concerning the chemistry and toxic effects of tetryl has been reviewed by other writers, we have intentionally avoided repetition and confined our remarks to the clinical experiences and observations of the medical department of an arsenal with the hope that we shall be of practical assistance to physicians who have patients working in the munitions industry.

Our study of the effects of tetryl was made on a working population of about 800 to 900 employees in the tetryl areas. Although most of the workers were engaged in loading operations, some were doing research work and manufacturing tetryl. To make our study complete we included a very small group that worked in the areas but had no direct contact with tetryl, such as guards, janitors and clerks.

These employees were observed in the work rooms, in the dispensary and during periodic examinations, which in most cases were done monthly and consisted of a complete history, blood count, urinalysis, blood pressure determination according to the Foulger system,¹

physical examination and other tests as indicated. Employees who exhibited dermatitis or complained of eye, nose and throat symptoms or other symptoms were given special attention.

Skin irritation was found to be a common complaint of tetryl workers. Although the incidence of dermatitis was gradually decreasing as the result of control measures, an average of 4 per cent of the tetryl workers were found to have dermatitis. Of all dermatitis cases seen at this arsenal, 62 per cent were caused by tetryl.

Most of the dermatitis cases occurred in the loading areas, probably because these areas employed the most people and most of the loading operations invited spillage and skin contact. Pellet production and tetryl manufacturing were to some extent closed operations and under better control and therefore offered little opportunity for dermatitis except in a very small group of employees who were allergic to tetryl. Only 2 cases of skin irritation were observed among the laboratory and research workers. One case was a problem of allergy, and the other case was that of a chemist who mopped perspiration from his face with a handkerchief he had carried in his work clothes while working in a dusty area. Severe reactions were noticed in several guards who patrolled areas near tetryl buildings. A clerk who handled time cards and shipping tickets from tetryl buildings was treated for tetryl dermatitis of the face but recovered completely only after she was given a job of handling reports from a tetryl free area.

In reviewing 404 cases of tetryl dermatitis we found that, in general, age, sex and color had no influence. It was noticed that most cases occurred in new workers one to two weeks after their introduction to tetryl. Some individuals developed skin irritation in a few moments, while others required several weeks or even months of exposure before a rash appeared.

The face was found to be most frequently affected, particularly in the circumocular region and in the areas of the face containing natural creases and folds, such as the nasolabial folds and the corners of the mouth. The neck was involved in many cases, particularly at the collar line and in the natural creases. Although the extremities were less frequently involved, these cases occurred at points of friction such as the wrists or ankles and extensor surfaces of the forearms. No cases involving the thorax or genital area were observed.

If seen early, the worker usually complained of slight burning or itching of the skin. Examination in these cases revealed nothing. If the person continued to expose himself to tetryl, an erythema developed in a few hours. In some cases the erythema was accompanied by an edema of the lower eyelids (fig. 1). In severe cases the edema involved the upper and lower eyelids and in some cases was so extensive as to distort the facial features beyond recognition. This phenomenon was particularly observed in workers who were so sensitive to tetryl that merely entering a tetryl area precipitated an attack in a short time.

The typical contact dermatitis as a rule progressed to a papulovesicular stage and then became brawny followed by scaling and some discoloration of the skin (fig. 2). This was particularly noticed in cases in which the neck had been affected by tetryl which was present in coat collars, and in cases of wrists and forearms that had been affected by contaminated coat sleeves or work benches. In a few cases secondary infections and an exfoliative dermatitis were superimposed because of the self medication administered by the patient in an

8. Permission to employ penicillin and sulfonamides simultaneously was given by Dr. Chester Keefer, chairman of the Committee on Chemotherapeutics and Other Agents of the National Research Council.

9. Since submitting this manuscript for publication the authors have had the opportunity to treat another patient with penicillin and sulfadiazine combined. The patient was a white boy aged 14 years with meningitis due to pneumococcus type 37; he made a prompt and complete recovery.

¹Foulger, J. H. Medical Control of Industrial Exposure to Toxic Chemicals, *Indust Med* 12: 214 (April) 1943

attempt to hasten recovery. Several cases of acne were found, particularly in young women, which abated after these workers were removed from tetryl exposure. Similar observations were made in several cases in which dermatophytosis developed on the palms and between the fingers.



Fig 1—Erythema accompanied by edema of lower eyelids

Our observations of the staining of the skin and discoloration of the hair from tetryl exposure did not differ from those of other investigators. It was definitely noticed, however, that the degree of staining in most cases was directly proportional to the cleanliness of the worker.

Individuals, in our experience, did not appear to develop any immunity or "hardening" on repeated exposures. In some cases when the person was permitted to return to work while under care for dermatitis the condition became worse and the person became exceedingly uncomfortable and had to be removed from the area. For this reason we pursued a policy of removing all operators from exposure until treatment was completed. By following this system all but a very small group of allergic persons were ultimately returned to their regular jobs.

All cases were treated as individual problems. In general persons mildly affected were treated with 10 per cent boric acid ointment and removed from exposure for several days. Persons more severely affected were sent home and treated with 5 per cent sodium bicarbonate wet dressings followed by boric acid ointment and were returned to their regular job after treatment was completed. Persons with pronounced allergy were not permitted to return to any exposure and persons with very severe allergy were granted releases to obtain a job in a tetryl free environment.

Thirty-five patients were treated with a 5 per cent aqueous solution of sodium thiosulfate. These patients were given 20 cc. intravenously each day for two or more days. In less than 50 per cent of these cases, itching and burning stopped and the rash began to fade. However, 10 cases failed to respond to this treatment. At this time of writing we have come to no conclusions, as this treatment is still under trial.

In evaluating the effect of tetryl on the eyes, ears, nose and throat as seen in over 500 employees in the course of one year's investigation at this arsenal, no

systemic reactions can be said to have occurred. Most of our complaints were exaggerated because of a wholesale fear of "tetryl or powder poisoning." Apparently in this arsenal "powder poisoning" phobia is part and parcel of fear of trinitrotoluene poisoning. All powder is suspect, but tetryl in particular, because of its early irritative effects, gives us the most complaints. This ungrounded fear of tetryl is unwarranted and should be discouraged by all concerned.

The effect of tetryl on the eyes and adnexa was one of primary chemical irritation, resulting in an erythema of the lids combined with pruritus of the lids. Trauma, rubbing and scratching resulted in lid edema. Some cases showed such pronounced edema, noninflammatory in nature, that allergy must be considered as playing some part. The bulbar and palpebral conjunctivas were not affected despite the often intense erythema and edema of the lids. Injection of the conjunctiva, when present, had been slight and easily explained on the basis of trauma. Those cases exhibiting pronounced conjunctivitis with lacrimation, photophobia, blepharospasm, itching and smarting have been demonstrated to be infectious in nature and merely coincidental with tetryl complaints.

In our study vision has never been affected. No cases of corneal infection or ulceration have been seen, and routine ophthalmoscopy has been negative.

Hearing is unaffected by working in, or exposure to, tetryl powder. In the past year there have been only 15 cases in which complaint was made of impaired hearing, and these were found to be due to cerumen impacted in the canal and to acute otitis media. We have been on the lookout for eighth nerve involvement but have found none.



Fig 2—Typical contact dermatitis.

Headache has not been a prominent symptom among our employees working in tetryl. Our statistics show that in an average of over 500 workers in this material complaints of headache occurred in only 4 per cent of workers coming to the clinic. On routine questioning by laboratory technicians, 21 per cent complained of headache at one time or another, but nothing specific as to the location, severity, times of occurrence or

duration was present. We therefore consider tetryl exposure of no significance in causation of headache.

The nose and throat have been the chief organs affected by tetryl in our eye, ear, nose and throat study. Complaints referable to the nose included all those seen with the ordinary common cold. Subjective symptoms included nasal dryness, burning or sneezing, stuffiness, smarting and anosmia. Added to these were many cases of epistaxis. These symptoms occurred early in the course of employment, usually in the first two weeks, although many employees complain of nasal irritation after only a few hours exposure. The subjective sensations were analogous to those of the common cold, except that the initial stage of dryness and smarting was not succeeded by increased mucous secretion. Objective signs were a dry injected nasal mucosa, with edematous turbinates. The color of the nasal mucosa was a bright scarlet, even in the colored race, except where allergy was present, when the color was slaty gray in the colored race and varied to a pale pink in the white race. In the absence of concomitant infection, no discharge was present. The mucosa remained dry and glairy and even after a week of further exposure did not become moist.

It was of interest to note that subjective complaints were in almost all cases associated with objective nasal pathologic changes in the form of deviations of the nasal septum, chronic hyperplastic rhinitis, nasal polypoidosis and varied forms of allergic rhinitis. It was practically an invariable finding to note that tetryl workers with poor nasal ventilation due to obstruction of septal deviations and enlarged turbinates had complaints early in the course of their work.

Epistaxis was a common finding, occurring in 14 per cent of workers routinely questioned by laboratory workers. It was never alarming or profuse. Its origin was usually at Kiesselbach's area and associated with capillary engorgement. Much of it was due to finger trauma occasioned by the dryness of the mucosa. Occasionally the lower turbinate, anterior border, showed factitious ulcers. Bleeding usually stopped spontaneously, and packing with cotton or gauze was rarely resorted to. The use of a simple nasal constrictor such as 2 per cent ephedrine sulfate drops was usually sufficient to restore nasal comfort and relieve complaints.

Throat symptoms consisted of dryness, cough, smarting and tightness in nervous persons. Objectively the pharynx was dry, glazed and injected. It was a conspicuous finding that most of these employees also showed pathologic change in the form of chronic infection of the tonsils, pharyngeal and lingual, as well as a chronic pharyngitis with lymphoid follicle enlargement.

These findings have led us to conclude that in workers exposed to tetryl for the first time antecedent infection and anatomic abnormalities of the nose and throat were primary agents in the development of symptoms. Many of these workers were advised to seek medical and surgical treatment, and those that did were able to return and work free from symptoms. Those that did not seek treatment were seldom free from symptoms and eventually had to be taken out of tetryl exposure.

The question of allergic sensitivity to tetryl, with regard to the nose and throat, is a moot one. In our opinion some patients did develop a typical nasal allergy on exposure to tetryl, with the result that the nasal tissues remained constantly engorged, an ensuing train of symptoms occurring analogous to those of hay fever.

These patients were never comfortable because of mouth breathing and when forced to wear a mask, as in certain operations with tetryl, were unable to do so with comfort. Removal from all tetryl exposure restored normal nasal function in these cases.

Laryngitis and tracheitis specifically due to tetryl, without other signs of infection, have not been found in tetryl workers here.

As our workers have frequent chest x-ray examinations, before employment as well as on annual physical examination, we have been able to detect any pathologic developments in the lungs. Employees with pulmonary pathologic changes are screened out on preemployment examination and are not permitted to work in toxic operations. Accordingly, we were able to keep a strict check on workers in tetryl but to date have been unable to find any pulmonary conditions attributable to powder.

It is notable that symptoms directly due to tetryl arose early in the course of employment. Those symptoms of the nose and throat which are the worst offenders were seen, almost without exception, in employees with previous pathologic conditions. In the few without obvious pathologic conditions, symptoms ceased spontaneously in one to two weeks, but, in the others, symptoms increased to the point where the worker was useless in tetryl operations, and in some workers apparent neuroses intervened. A few workers who developed a nasal allergy on exposure to tetryl were removed early. Systemic symptoms due to tetryl, initiated through the nose and throat, have not been seen.

In the course of routine periodic examinations of tetryl workers we found anemia (defined as less than 11 Gm. of hemoglobin per hundred cubic centimeters for women, less than 12.5 Gm. for men) in only 4 per cent, and 92 per cent of the anemic persons were women. There is no reason to believe that this exceeded the figure for the population at large.

White blood cell count findings were difficult to interpret. Leukocytosis and leukopenia appeared to be completely unrelated to the type and duration of exposure, symptoms or complaints. About the only conclusion we could draw is that leukopenia occurred about twice as often among colored workers as among white workers, while leukocytosis had about the same occurrence in the two races.

Abnormal blood pressure findings occurred with varying frequency in 18 per cent of tetryl workers. Four per cent was hypertension in workers of an average age of 42 years, compared to an average age of 33 years for all tetryl workers. The remaining 14 per cent consisted of hypotension, low pulse pressure and the like, and the average age was 33, the same as the average for all tetryl workers. We have regarded severe or persistent blood pressure abnormalities as sufficient cause for removal from tetryl exposure.

PREVENTIVE PROGRAM²

With the aid of the management and the safety department, we were able to carry out an effective preventive program, which was divided into several phases.

Preemployment and Periodic Examination.—All workers were given a complete preemployment examination, and those who were found to have a disqualifying history and physical defects were not assigned to any work involving tetryl exposure. Employees were given a physical examination annually, and those who were

2. Probst, E. W., and Lewis, L. D.: An Effective Preventive Medical Program, *Indust. Med.* 13: 43 (Jan.) 1944.

found to have physical defects or a history which contraindicated tetryl exposure were removed from exposure and placed in another job.

Routine laboratory examinations of tetryl workers were done monthly or quarterly, depending on the degree of the exposure and the condition of the worker. Significant or persistent abnormalities of blood count, urinalysis or blood pressure were considered indication for removing the worker from tetryl exposure, although each case was reviewed individually by the industrial medical officer before removal.

Environment.—Periodic inspections of the tetryl areas were conducted, and every effort was made to eliminate or reduce the dust by modifying the operations and installing ventilation and exhaust systems. Skin contact with the tetryl powder and pellets was reduced to a minimum.

Protective Clothing and Personal Hygiene.—All exposed workers were furnished with special powder uniforms, which offered fairly good protection. These uniforms were changed frequently and were laundered at the arsenal. Adequate washing and bathing facilities with sufficient soap and towels were made available. Since protective ointment and respirators were found to be generally unsatisfactory, these items were used only when other methods were inadequate.

Education.—An educational program was established to encourage cleanliness in operations, personal hygiene, safety and better nutrition. This program was accomplished by posters, placards, editorials in the plant newspaper and conferences with individual workers.

Other Measures.—In some dusty areas workers were advised not to use their handkerchiefs and were encouraged to use paper wipes. They were also advised not to bring their lunches or personal belongings into the work rooms.

In case of workers with signs or symptoms referable to tetryl exposure, the health records and the work environment were immediately checked and reviewed before any action was taken. Cases exhibiting any severe reaction were removed immediately from exposure.

CONCLUSIONS

The most common finding in tetryl workers at an arsenal was contact dermatitis. A small percentage of the workers were found to show evidence of sensitivity.

Those individuals who had nose and throat complaints showed preexisting pathologic changes except for a few cases of nasal allergy. No evidence of eye pathologic change due to tetryl was noticed.

Under our methods of control, no evidence of systemic illness developed.

First Hospital in Western Europe.—The first hospital in western Europe was founded in 380 A. D. by Fabiola, a Roman matron of distinguished piety. The exact site of this rather famous hospital is uncertain, but St. Jerome describes it as "a house in the country for the reception of the unhappily sick and infirm persons who were before scattered among the places of public resort; where they would be furnished in a regular way nourishment and those medicines of which they might stand in need." To conform with the growing Christian idea of charity, hospitals began to be founded for special purposes; there were hospitals for the sick alone, for foundlings, for orphans, for the helpless poor, for the aged, and for poor and infirm pilgrims.—The Hospital in Modern Society, edited by Arthur C. Bachmeyer and Gerhard Hartman, New York, Commonwealth Fund, 1943.

TREATMENT OF MULTIPLE FURUNCULOSIS WITH PENICILLIN

ROSE COLEMAN, M.D.

AND

WALLACE SAKO, M.D.

NEW ORLEANS

The incidence of furunculosis superimposed on miliaria is much increased during the warm summer weather. In the South this condition constitutes a common problem which often proves to be very refractory to treatment. The remarkably rapid response of multiple furunculosis to penicillin therapy we have observed in 6 young children serves as the basis of this communication.

REPORT OF CASES

CASE 1.—R. B., a white boy aged 1 year, was admitted to Charity Hospital on June 19, 1944 with numerous furuncles of one week's duration scattered over the scalp, face, neck, shoulders, chest, back and the left thigh. The patient did not



Fig 1 (case 6).—Front view of infant with multiple furuncles of scalp, face and neck at the beginning of penicillin therapy.

appear to be ill, and the rectal temperature was 100.6 F. The physical findings were normal and the blood serologic reaction and the Mantoux test were negative. Local therapy and sulfadiazine administered orally for seventeen days brought no appreciable improvement in the condition of the skin. On July 7 an initial dose of 20,000 units of penicillin was given intramuscularly followed by 10,000 additional units every three hours until July 13. The patient received a total of 440,000 units. Within twenty-four hours after penicillin treatment was begun distinct improvement in the furuncles was noted and without the aid of any local therapy all of the lesions were healed in four days (July 11) except for a large abscess on the left thigh, which drained spontaneously and healed two days later. The patient was discharged on July 14 completely cured of all skin lesions.

CASE 2.—J. A. L., a white boy aged 7 months, was admitted to Charity Hospital on June 22, 1944 with severe miliaria and widespread furunculosis of three weeks' duration involving

From the Department of Pediatrics, Louisiana State University School of Medicine and the Charity Hospital of New Orleans.

the scalp, face, neck and upper portion of the trunk. The remainder of the physical examination was negative. The temperature on admission was 102 F. rectally and fluctuated between 97 and 102 for one week. All the laboratory findings were negative except for a leukocytosis of 26,000. Since local

was given. Within forty-eight hours the furuncles began to regress, and hard papular swellings as well as the small fluctuant furuncles became absorbed and completely disappeared after four days of penicillin treatment. The patient was discharged after six days of hospitalization.

CASE 4.—E. B., a Negro boy aged 3 years, was admitted to the hospital June 21, 1944 for cellulitis of the right leg and numerous furuncles of the scalp, face, neck, chest and extremities. The rectal temperature was 101 F. and the blood culture was negative. An initial intramuscular injection of 10,000 units of penicillin was given followed by an additional 5,000 units every three hours until the patient had received a total of 230,000 units. The temperature returned to normal in twenty-four hours and the cellulitis cleared in forty-eight hours. The furuncles began to regress in twenty-four hours and completely disappeared in seventy-two hours except for two large fluctuant abscesses of the scalp, which were incised and drained and completely healed two days later. The patient was well when discharged on June 29.

CASE 5.—B. J. M., a white girl aged 9 months, was admitted to Charity Hospital on June 13, 1944 with multiple furuncles

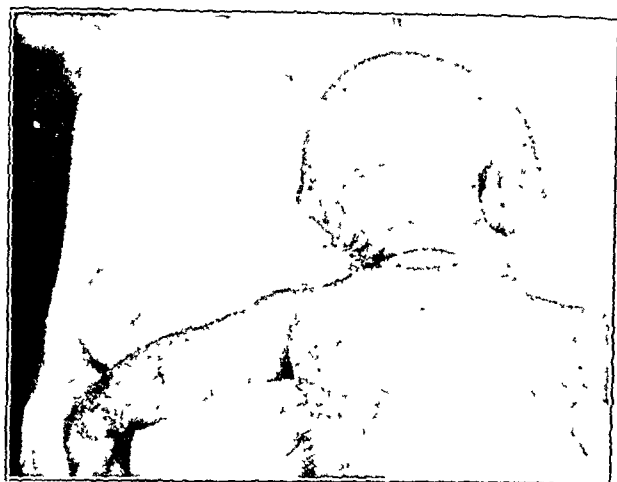


Fig. 2 (case 6).—Rear view of patient before treatment

therapy and sulfadiazine given orally for seven days resulted in no improvement, the intramuscular administration of penicillin was started on June 30. The initial dose of 20,000 units was followed by additional injections of 10,000 units every three hours until the patient had received a total of 460,000 units. No local therapy was used after penicillin was started. All the lesions, several of which were fluctuant, improved in twenty-four hours and had completely disappeared seventy-two hours after the penicillin therapy was started. The patient was discharged on July 14, completely cured.

CASE 3.—M. C., a white girl aged 10 months, developed a heat rash in May 1944. On June 1 examination revealed



Fig. 3 (case 6).—Front view of patient showing disappearance of furuncles after five days of penicillin therapy

multiple furuncles on the scalp, face, neck, chest and back. The blood serologic reaction and the blood culture were negative. Local therapy consisting of frequent baths, saline packs, sulfathiazole ointment and staphylococcus vaccine proved of no avail. The patient was hospitalized on June 12 and penicillin therapy was started, 5,000 units being administered intramuscularly every three hours. A total of 200,000 units of penicillin



Fig. 4 (case 6).—Rear view of patient after treatment

of two weeks' duration and bronchopneumonia. The temperature on admission was 103 F. rectally. The physical examination disclosed numerous furuncles over the entire scalp, neck and upper part of the chest. X-ray examination of the chest revealed bronchopneumonic patches of the right lung.

Treatment consisted of incision and drainage of the larger fluctuant abscesses. On June 14 an initial dose of 10,000 units of penicillin was given intramuscularly followed by 10,000 additional units every three hours. A total of 480,000 units was given. The temperature returned to normal in four days. The furuncles and pustules improved rapidly and were completely healed on June 19. The patient was discharged on June 24 and had suffered no subsequent recurrence of furunculosis when seen on July 11.

CASE 6.—E. M., a Negro girl aged 6 months, was admitted to the hospital on July 13, 1944 with the complaint of multiple "boils" of four weeks' duration. The temperature on admission was 102 F. rectally. The physical examination revealed numerous furuncles, small pustules and papules scattered over the scalp, face, neck and shoulders (figs. 1 and 2). A large fluctuant abscess about 3 by 3 cm. was located in the left occipital region. The remainder of the physical examination was negative. The blood culture and serologic test were both

negative. Culture of pus from the abscesses revealed *Staphylococcus pyogenes aureus*. The patient was started on penicillin on July 14. The initial dose was 10,000 units administered intramuscularly followed by 5,000 units every three hours. The total dose was 230,000 units. The temperature came down to normal in three days. The superficial furuncles cleared up in seventy-two hours and the larger furuncles disappeared in five days. The large fluctuant abscess healed promptly after incision and drainage (figs. 3 and 4).

SUMMARY

The rapid disappearance and cure of multiple furunculosis observed in 6 children under penicillin treatment indicates a result far superior to any previously known therapy for this condition.

Clinical Notes, Suggestions and New Instruments

ALLERGY TO PENICILLIN

LEO H. CRIEP, M.D., PITTSBURGH

Urticarial reactions to penicillin have been described by Lyons¹ as occurring in 12, or 15.7 per cent, of 209 cases treated in army hospitals. Following is the report of a case of penicillin allergy manifested by generalized severe urticaria and studied from the point of view of the possible immunology involved in this reaction:

REPORT OF CASE

A man aged 23 was admitted to the United States Veterans Hospital, Aspinwall, Pa., during March 1944 with a diagnosis of suppurative arthritis of the right hip. This condition started in the summer of 1943 while the patient was in the service and followed an abscess on his left elbow. The abscess was incised. Because it was associated with osteomyelitis, penicillin therapy was begun on Oct. 13, 1943. The patient received 200,000 units daily for a period of fourteen days. Penicillin therapy was resumed on Nov. 6, 1943, and he received 120,000 units daily

TABLE 1.—Results of Direct Skin Tests

	Patient C. H.	Controls			
		1	2	3	4
1. Penicillin conc.....	+++	+++	++	++	++
2. Penicillin 1:10.....	+++	++	+	0	0
3. Penicillin 1:100.....	++	0	0	0	0
4. Saline solution.....	0	0	0	0	0

TABLE 2.—Precipitin Tests with Penicillin

Blood Serum	Penicillin Conc.	Penicillin 1:100
1:10.....	Positive	Positive
1:50.....	Positive	Positive
1:100.....	Positive	Positive
1:1,000.....	Slightly positive	Slightly positive
1:10,000.....	Slightly positive	Slightly positive
1:20,000.....	Slightly positive	Slightly positive

until November 12. Immediately on resumption of this therapy, that is on November 6, and following the administration of the first dose of penicillin in this course of treatment, the patient developed massive generalized urticaria, which persisted until the penicillin therapy was discontinued on November 12. The patient stated that the urticarial reaction would occur almost immediately on his receiving the injection of penicillin, and in the period when the drug was given daily the urticaria was continuous and universal. He presented no family history

of allergy. He stated that he has never had urticaria before. There was no history of hay fever, asthma or any other allergic manifestations.

On his last admission to the hospital the measurements of the legs revealed that there was a shortening of the right leg of approximately 3 cm., this shortening being located above the greater trochanter. Roentgenograms revealed evidence of a suppurative process in the right hip with partial absorption of the articular surface of the head of the femur and the acetabulum; the laboratory work was essentially negative; the urine, blood count and serologic reaction were negative.

SPECIAL INVESTIGATION

The following represents an attempt to study the immune bodies accompanying this reaction:

1. *Direct Skin Tests to Penicillin*.—Direct skin tests (intra-dermal) with penicillin drug solution yielded the results, as compared with controls, given in table 1.

2. *Passive Transfer Tests*.—Presence of Reagins: Passive transfer tests performed with the patient's serum yielded a positive reaction with penicillin in a dilution of 1 to 100. These were done on two substitutes. The controls were negative.

3. *Precipitin Tests with Penicillin*.—Controls were done with normal serum, and these showed no precipitin reaction.

4. *Anaphylactic Antibodies*.—An attempt was made to sensitize passively 2 guinea pigs with the serum of the sensitive patients. The serum was injected intravenously into the animals. Following a period of twelve to twenty-four hours, penicillin solution was administered by the same route. Neither guinea pig showed evidence of anaphylactic shock. It would appear therefore that there were no anaphylactic antibodies to penicillin in the patient's serum.

5. *Comparison with Skin Reaction to Penicillium*.—Direct skin tests on the patient with penicillium extract were negative. This is of interest because Feinberg² recently found that individuals clinically sensitive to penicillium spores did not give a positive reaction to penicillin. It would therefore seem that there is no cross sensitization between penicillin (drug) and penicillium (spore) extract.

COMMENT

The urticarial reaction presented by this patient is obviously one of allergy to penicillin. In view of the fact that little is known about the method of preparation of penicillin, it was not possible to conduct investigations which would indicate whether the drug or culture mediums employed in its preparation might be the offending allergen. However, direct skin tests to corn extract and corn steep were negative. Present evidence indicates, however, that the sensitivity is to penicillin itself. This allergy, in all probability, is not unlike that shown in serum allergy. As is the case with other instances of sensitization to biologic products, such as insulin, posterior pituitary injection and liver extract, the reactions occurred after the resumption of treatment following a period during the course of which the drug was discontinued.³ At this time the urticaria occurred immediately after the first injection of the second series. The same thing occurred some months later when treatment with the drug was reinstituted.

There seems to be evidence of the presence of some immune substances in the serum of this patient, such as reagins and precipitins. This is proved by the positive direct skin test, by the positive passive transfer and the positive precipitin test. Just what role, if any, these antibodies might have in mediating the reaction is not exactly clear.

These findings are of interest because they vary with the statement contained in the report¹ that in the patients who showed an urticarial reaction to penicillin "the course" of the urticaria was "independent of continuance or cessation of treatment." Also that "subsequent courses of penicillin therapy in patients with a history of urticaria during the first treatment period have been uneventful and not associated with recurrent urticaria." None of the patients included in the report quoted showed precipitins or positive skin reactions to penicillin.

2. Feinberg, S. M.: Penicillin Allergy, *J. Allergy* 15: 271 (July) 1944.

3. Crip, L. H.: Allergy to Liver Extract, *J. A. M. A.* 110: 506 (Feb. 12) 1938; Allergy to Pancreatic Tissue Extract, with Report of 2 Cases, *J. Allergy* 12: 154 (Jan.) 1941.

From the Allergy Clinic, U. S. Veterans Hospital, Aspinwall, Pa., and the Allergy Clinic, University of Pittsburgh School of Medicine.
1. Lyons, C.: Penicillin Therapy of Surgical Infections in the U. S. Army, *J. A. M. A.* 123: 1007 (Dec. 18) 1943.

SUMMARY

1. A case of acquired sensitivity to penicillin was observed.
2. Penicillin allergy is probably unrelated to sensitivity to *Penicillium* spores.
3. Associated with penicillin allergy, there may be found in the serum of the patient immune bodies (reagins and precipitins), but their exact role in the reaction is not known.
4. This form of allergy represents one analogous to drug or serum allergy.

1004 May Building.

ALLERGIC HEADACHE

AN UNUSUAL CASE OF MILK SENSITIVITY

THERON G. RANDOLPH, M.D., CHICAGO

This case report illustrates many of the pitfalls in the general recognition and specific diagnosis of allergic headache. It is of further interest in view of the severity of symptoms and the pronounced degree of food sensitization existing in the absence of skin tests.

REPORT OF CASE

I. K., a graduate nurse aged 24, developed her initial sick headache at the age of 14, one year after the menarche. Symptoms recurred in 1939 at the age of 17. An allergic investigation at this time revealed a negative past and family history for other evidences of allergic manifestations. Cutaneous tests, including foods, were entirely negative. She was placed on a Rowe No. 1 elimination diet for two periods of ten days each. One headache occurred during this interval. At the time of the diet trials she was subject to a headache every three to four weeks.

In May 1940 the attacks of head pain became more frequent and severe. In the following eighteen months she was hospitalized twenty-five times because of severe attacks with one hundred and ten days' hospitalization. Many attacks did not require hospital admission. During this period she lost approximately one third of her time as a student nurse because of incapacitating headaches.

A typical attack began with a sense of pressure and pain over the right frontal sinus, followed by drooping of the right upper lid and twitching of both upper lids and terminated in a prolonged period of severe throbbing right temporal pain which extended to involve the right ear region. The headaches were associated with pronounced photophobia, dizziness, anorexia, nausea and vomiting. When the head pain was most severe she often lapsed into a state of altered consciousness which lasted from a few minutes to as long as forty-five minutes. At the onset of these periods she temporarily lost motor control, several times falling and injuring herself. These attacks were characterized by varying degrees of stupor from which she could be only partially aroused. She appeared to be oriented but responded with a prolonged reaction time. Apparently perception was normal, but she had some difficulty in enunciating and spoke in a monotone with slurring of syllables. She claimed that during these times she had difficulty to find the words to express her thoughts. There were no convulsions, incontinence, opisthotonos or biting of the tongue.

The headaches varied in length from two hours to ten days. They were associated with and followed by fatigue to the point of utter exhaustion. As the headaches became more frequent, troublesome fatigue persisted between attacks, materially interfering with her efficiency in studying and working. Her fatigue was unrelieved by obtaining the customary amount of rest prescribed for student nurses, nor was it relieved by excessive rest. It occurred whether at work or on vacation. Coincident with the persistent fatigue, her friends noticed that she was less alert than formerly.

Her physical examination was consistently negative between attacks. During attacks she was extremely restless, writhing and clutching her head in her arms with each recurrent pain. There was drooping and slight edema of the right upper eyelid, twitching of both upper lids, a fine nystagnus and tenderness

of the right face and neck region. At the height of the symptoms the pulsations of the right temporal and carotid vessels were stronger than the left. There were no other physical findings.

Blood counts and other routine laboratory data were within normal limits during and between attacks. A lumbar puncture during a headache revealed the spinal fluid under normal pressure and negative on laboratory tests. X-ray films of the skull were negative. Electroencephalograms will be described in a succeeding article.¹

Provocative doses of 0.1 cc. of 1:10,000 and 0.05 cc. of 1:100,000 dilutions of histamine diphosphate produced violent headaches. A course of histamine "desensitization" beginning with 0.025 cc. of 1:1,000,000 dilution of histamine diphosphate, gradually increasing the dose twice daily, failed to alter the course of symptoms. Histamine administered by iontophoresis was also without effect. Doses of 0.3 and 0.1 cc. of a 1:100 dilution of histamine-azo-protein ("Hapamine") produced severe headaches within an hour after subcutaneous injections.

Various drugs were ineffective in affording symptomatic relief; these included acetylsalicylic acid, phenobarbital, pentobarbital, phenytoin sodium, ergotamine tartrate and various opiates.

Surgical section of the right middle meningeal artery was performed during an attack April 3, 1942. The previous headache had subsided by the time consciousness was regained from the intravenous pentothal sodium anesthesia. There were no abnormalities in the caliber of the middle meningeal artery or the appearance of the dura. Following this she remained symptom free for a period of three weeks but then developed frequent attacks of "tic-like" pain in the region of the right ear. On May 22, 1942 a suboccipital craniectomy with section of the right ninth nerve was performed for relief of the severe, lancinating ear pain. This operation was followed by Bell's palsy of three weeks' duration and complete relief of all head pain for five weeks. The sick headaches then returned in their former severity and frequency.

In the presence of long standing, unexplained symptoms, psychogenic factors were considered of increasing etiologic importance. A diagnosis of anxiety hysteria was made. Attempts to explain her symptoms from this point of view shamed and antagonized the patient, following which she tried, unsuccessfully, to conceal her attacks.

Because of her persistent symptoms she was finally dismissed from Nursing School in October 1942.

In mid-November 1942 she was restudied from the standpoint of allergic disease. Although foods were not suspected in relation to her attacks, she had been in the habit of drinking a quart of milk daily for many years, and beef had been her principal meat. It is of interest that during several of her more prolonged attacks she refused all food except ice cream.

Cutaneous and intracutaneous tests were negative.

She was started on a series of elimination diets at a time when the fatigue was pronounced and headaches were present every five to seven days. The initial diet eliminated milk except for that in butter, cheese and small amounts in baked goods, all cereals except rice, all meats except lamb and, in addition, eggs, legumes, citrus fruit, chocolate, nuts and condiments. On the fourth day of this diet she reported a decided general improvement, with striking relief of her dragging fatigue. She had no headaches for a period of two weeks except after one meal in which she failed to follow the diet. This contained milk in mashed potatoes and a large serving of beef.

When milk was returned to the diet after two weeks of avoidance, the first glass for breakfast was tolerated; the second glass at noon was followed in forty minutes by a violent headache during which she became semiconscious for a period of thirty minutes, the headache persisting for forty-eight hours. Returning beef to the diet in repetitive doses also produced headaches. Similar but more mild reactions followed attempts to replace chocolate, tomato and grape juice. All other foods have been taken without trouble. With the complete avoidance of listed foods she has had no unexplained headaches for the past twenty months. She was readmitted to Nursing School,

From the Allergy Clinic, Department of Internal Medicine, University of Michigan Medical School. Financed in part by Parke, Davis & Company.

1. Bagchi, B. K.: Migraine and the Electroencephalogram, to be published.

graduated, and is now regularly employed on the graduate staff. Her previous fatigue has been entirely relieved and she feels rested after the usual amount of sleep. The control of her allergic symptoms has resulted in a decided change in her personality.

The milk sensitivity in this case appeared to be one of severe and increasing degree. Although butter and cheese were originally tolerated, she began to notice headaches in January after butter and in March 1943 after cheese. A later attempt was made to include a small amount of butter in her diet. Within a few days her former fatigue returned, followed on the eighth day by a severe headache which persisted for three days. All milk products have been rigidly avoided since. Of two recent severe headaches, each beginning thirty minutes after a meal, one was traced to the ingestion of buttered vegetables and the other to the use of the small amount of milk solids contained in a teaspoon of commercial salad dressing. These were both errors made in the preparation of her special tray and were traced in retrospect after the onset of symptoms.

In November 1943 she started to work in the infants' ward. In preparing the evaporated milk formula for the day she suddenly became dizzy, developed severe pain over the right eye and in attempting to leave the room fell to the floor stuporous. Head pain and vomiting persisted for three days. She returned to the formula room on the second day, but her headache became much worse and she reported off duty. She came back on the third day and after being in the formula room forty-five minutes developed erythema, pruritus and urticaria of the exposed parts of the body.

She was unable to work with infants who were being fed evaporated milk. On three different occasions babies regurgitated on her skin; although she washed the milk off immediately, erythema developed at the sites within twenty minutes. Because of the persistent fatigue, generalized pruritus and recurrent headaches associated with work in the nursery, she was excused from these duties.

On April 22, 1944 an electroencephalogram was obtained prior to and following the ingestion of a small dose of milk taken fasting (1 cc. diluted to 100 cc. with water). To control the psychogenic factor, dilute amphetol having an identical taste and appearance (when the two samples were tested by samplers the milk was not identified) was given first, the patient understanding that she was receiving milk. Forty-five minutes later she developed mild twitching of the right upper lid and nausea which lasted twenty minutes. No other symptoms occurred during a period of ninety minutes.

She was then given 1 cc. of milk in water, understanding that she was receiving a second dilute dose. Ten minutes later she developed throbbing right temporal pain which became progressively more severe. On two occasions in the following five hours at the height of her agonizing pain she lapsed into semiconsciousness for several minutes. The headache syndrome persisted two days, the residual fatigue for an additional day.

Cutaneous tests with raw milk and the standard milk extract were again performed July 20, 1944 and found negative. One-half hour later 0.02 cc. of a 1:10 dilution of the scratch test material (the standard intracutaneous test for milk) was injected intradermally. Ten minutes later she noted flushing and itching of the anterior part of the neck and face; this became generalized in the next five minutes. Epinephrine hydrochloride 0.5 cc. in a dilution of 1:1,000 was then administered subcutaneously, following which the erythema and pruritus gradually disappeared. Thirty minutes after the intracutaneous test she developed mild right frontal head pain, which became progressively more severe. Nevertheless she reported on duty two hours after the test, starting an operation as a surgical nurse. During the operation the pain became extreme and was associated with severe dizziness. Without warning, except for a transient sensation of faintness, she fell to the floor two hours and thirty minutes after the skin test. Although altered consciousness persisted for only two or three minutes, headache, dizziness, nausea and weakness continued, making it necessary to report off duty. With rest, all symptoms except for residual fatigue subsided after a duration of three and one-half hours.

The intracutaneous test site was negative when read at twenty minutes and remained so throughout the headache. After the head pain had subsided she noticed mild pruritus at this area, followed by erythema 2 cc. in diameter, which reached a maximum between six and seven hours after the injection. A wheal was not observed at any time and there was very little edema as judged by the insignificant degree of elevation. The site was negative the following morning and remained so thereafter. There were no delayed reactions at the scratch test sites.

COMMENT

This case illustrates how the diagnosis of allergic headaches may be missed by the routine allergic investigation including history, skin tests and the trial of elimination diets for short periods when the incidence of the attacks is greater than once in two weeks. No clues were obtained from the past and family history, as they were both negative for other allergic manifestations. This, however, is not an uncommon finding, and one must always be alert to the possibility of the initial allergic expression.

It is of interest that milk, the major offending food, had been received in large amounts daily for many years and that beef had been the principal meat of the diet. This is such a common observation, notwithstanding the fact that acute episodes may occur only occasionally, that the elimination of those foods eaten most frequently and in greatest abundance sometimes results in improvement, giving clues to the major offenders.

Cutaneous tests to the common allergens were negative in 1939, cutaneous and intracutaneous tests were again negative in 1942, and both cutaneous and intracutaneous tests with milk were negative in 1944 as these reactions are customarily read. The last intracutaneous injection of milk was followed by a constitutional reaction and headache, following which there was a moderate delayed reaction at the test site. The absence of skin tests with milk, as performed and read by standard technic, is in striking contrast to the extreme and increasing degree of milk sensitivity. This case affords additional evidence of the general unreliability of the skin test as a diagnostic method in food allergy.

The production of severe symptoms by the subcutaneous injection of 0.1 cc. of a 1:10,000 dilution of histamine diphosphate is suggestive of "histaminic cephalgia" as described by Horton.² In fact, this is the minimal provocative dose recommended by him as a diagnostic measure. It is of interest that a twenty-fold diminution in dosage (0.05 cc. of a 1:100,000 dilution) also produced an abrupt and violent attack, identical as far as could be determined with the attacks occurring after the ingestion of milk. Repeated efforts to "desensitize" with histamine by daily and twice daily injections failed to alter the general course of the headaches.

The fact that the patient was temporarily improved after extensive surgical procedures is not an uncommon finding. Relief of symptoms from four to six weeks after surgery of various types is not an infrequent experience in dealing with allergic manifestations.

The severity of the cephalgia and the close relationship of the violent pain with periods of altered consciousness or stupor are unusual features of this case. It is of interest that the patient never had an attack of altered consciousness which was not associated with severe headache. From the clinical standpoint it appeared that she lapsed into a state of altered consciousness as a result of the severity of the pain. Although slightly suggestive from the standpoint of the mode of onset, the features of these bouts of semiconsciousness were not typical of a convulsive disorder such as epilepsy. The interpretation of the electroencephalograms is of interest in this respect.³

The "fatigue unrelieved by rest" occurring in this case both during and between attacks of headaches deserves emphasis, as it must be considered an expression of the uncontrolled allergic reaction. This symptom was first described by Rowe⁴ in 1930 and called allergic toxemia. He⁴ has observed that it

2. Horton, B. T.: Use of Histamine in Treatment of Specific Types of Headaches, *J. A. M. A.* **116**: 377 (Feb. 1) 1941.

3. Rowe, A. H.: Gastrointestinal Food Allergy: A Study Based on 100 Cases, *J. Allergy* **1**: 172, 1930.

4. Rowe, A. H.: Allergic Toxemia and Migraine Due to Food Allergy, *California & West. Med.* **33**: 785, 1930.

is frequently associated with head pain of allergic origin. It is a common symptom resulting from intolerance to foods and may be associated with any of the clinical manifestations of allergy.⁵ In an occasional case it may be the only evidence of allergic imbalance at the time the patient is seen. In a recent survey⁶ periods of this type of fatigue were found to occur more commonly in persons with a positive past history of allergy than in a control group with negative histories of allergic disease. "Fatigue unrelieved by rest" is so frequently associated with the allergic headache that relief of the former as the result of an elimination diet is often the first evidence of an allergic causation of the latter.

The common features of the fatigue and weakness of the uncontrolled allergic reaction, as illustrated in this case, and the debility of the patient with neurasthenia must be carefully differentiated. This is obviously difficult to do and in some cases, particularly if the allergic reaction is of long standing, both factors may be present. The fact remains, however, that fatigue as a symptom of the allergic reaction has received little emphasis and is not generally appreciated in contrast to the more widely known relationship of fatigue as a manifestation of a psychogenic disturbance.

This case is a good example of long standing incapacitating headaches in which the absence of apparent organic cause led to the assumption that the headaches were of psychogenic origin. It should be recalled that there are no measurable residual structural effects as a result of multiple attacks of allergic head pain. The possibility that headaches may be of allergic origin should be considered prior to establishing the diagnosis of psychogenic headaches.

SUMMARY

A case of allergic headache of unusual severity associated with fatigue and a state of altered consciousness resulting from sensitization to milk illustrates many of the pitfalls in the recognition and specific diagnosis of allergic head pain.

700 North Michigan Avenue.

Council on Foods and Nutrition

With the increasing emphasis being placed on vitamins in nutrition the practice of adding these substances to many foods has become widespread. Fresh milk has been one of the foods to which the addition of several vitamins as well as minerals has been advocated. Several products of this type are now on the market. The Council has authorized for publication the following report discussing this principle of milk fortification.

GEORGE K. ANDERSON, M.D., Secretary.

FORTIFICATION OF MILK WITH VITAMINS AND MINERALS

For several years the practice of fortification of milk with vitamins and minerals has been increasing. The tendency exists to have a retail unit of milk contain the full daily requirement of most of the vitamins and minerals for which requirements have been stated by the Food and Drug Administration. On several occasions the Council on Foods and Nutrition has been requested to express an opinion concerning these fortifications.

Several years ago the Council stated a policy of encouraging restorative additions of dietary essentials to foods to recognized high natural levels, provided the additions are limited to essentials for which a wider distribution is considered to be in the interest of public health. On several occasions the Council has reaffirmed this policy. The Council has accepted and encouraged the fortification of milk with vitamin D well beyond any natural level because of the belief that such fortification is in the interest of public health. Vitamin D is not present in important amounts in a customary diet unless fish oils are

included. Milk is an ideal carrier of vitamin D because of its content of calcium and phosphorus, with the utilization of which vitamin D is directly concerned. The Council has not approved any other addition to milk.

A fortified milk has been submitted to the Council for acceptance. With the exception of ascorbic acid, each quart of this product contains the minimum daily adult requirement of those vitamins and minerals for which the Food and Drug Administration has established requirements, and in addition it contains 10 mg. of niacin. The label (bottle cap) statement of content is as follows: vitamin A, 4,000 units; thiamine, 1 mg.; riboflavin, 2 mg.; vitamin D, 400 units; niacin, 10 mg.; calcium, 1 Gm.; phosphorus, 0.8 Gm.; iron, 10 mg.; iodine, 0.1 mg. Of these components the entire amounts of calcium and phosphorus are natural to the milk and do not represent additions. All other materials are added in whole or in part.

The question arises as to whether it is in the interest of public health to fortify milk with vitamin A, thiamine, riboflavin, niacin, iron and iodine or any one of these materials.

The vitamin A content of milk varies with the feed of the cow. Winter milk of barn fed cows contains approximately half as much vitamin A as does the milk of cows on good pasture. With this wide range of content, fortification such as would insure a minimum content of 4,000 units to the quart must be with an amount which would be certain to raise to this level those milks with the lowest values. In a considerable proportion of instances the addition would be in excess of the need, particularly in the summer when the natural content of milk is at its maximum. In at least a commercial sense this excess would be wasted.

Some vitamin A deficiency has been shown to exist in this country. Such deficiency as exists is to be found chiefly at the lowest economic levels. In the surveys reported by the U. S. Department of Agriculture (Miscellaneous Publication Number 452, 1941) among nonrelief families in all sections of the country, intakes of vitamin A less than 5,000 units daily are recorded for only two of thirty-seven groups. In both instances the weekly expenditure for food was less than \$2.08 for each person. Such persons are not likely to buy milk sold at a premium. Those who consistently use milk are likely to be ingesting diets of good quality and therefore of good vitamin A content. It appears that little public health need exists for fortification of milk with vitamin A. Such need as may exist is insufficient to warrant Council acceptance of milk so fortified.

The thiamine content of milk varies, but 0.38 mg. to the quart may be considered as an approximate average, with about 10 per cent loss with pasteurization. This amount is more than that required for the metabolism of milk. Milk more than carries its own load as regards thiamine. Any fortification would be for the purpose of covering the deficits of other foods. Such deficits as may occur are chiefly those associated with the refinement of foods, especially cereal foods. Much effort is being expended on a national scale to restore to cereal foods those nutritional essentials which have been lost in the processing. This is a laudable effort which deserves every encouragement. Cereals are much more important as a vehicle for added thiamine than is milk. Almost every one eats cereal in some form, whereas unfortunately milk does not yet have universal use. Those in the lower economic levels are the ones who subsist importantly on cereal foods and are the ones who are less likely to use milk. The greater the addition to the cost of milk because of fortification, the less likely are those who need it most to get it. It is concluded that public health need is not particularly well served by the fortification of milk with thiamine and that such need as may exist is not sufficient to warrant Council acceptance of thiamine fortified milk.

An average content of riboflavin in milk is approximately 1.8 mg. to the quart, an amount which is four to six times that required for metabolism of the milk. While liver and yeast are excellent sources of riboflavin, milk is the only common food likely to be ingested daily which supplies a high proportion of the requirement for this material. The same type of discussion as given for thiamine fortification of milk applies also to fortification with riboflavin. The fortification of processed cereal foods with riboflavin is considered to be more useful and more effective in supplying the riboflavin needs of the popu-

5. Randolph, T. G., and Gibson, E. B.: Blood Studies in Allergy: II. The Presence in Allergic Disease of Atypical Lymphocytes and Symptoms Suggesting the Recovery Phase of Infectious Mononucleosis, *Am. J. M. Sc.* 207: 638, 1944.

6. Randolph, T. G., and Hettig, R. A.: The Coincidence of Allergic Disease, Unexplained Fatigue and Lymphadenopathy: Possible Diagnostic Confusion with Infectious Mononucleosis, *Am. J. M. Sc.*, to be published.

lation than is the fortification of milk. It is concluded that such need as may exist for the fortification of milk with riboflavin is not sufficient to warrant Council acceptance of riboflavin fortified milk.

Despite its low niacin content, milk has long been known as a food useful in a pellagra preventive diet. Pellagrins are not milk drinkers. Niacin deficiency has not been recognized in those who ingest diets which are average for the country as a whole. Niacin is sufficiently plentiful in meat and fish and in potatoes, tomatoes, peas and other vegetables to insure against deficiency. The foods mentioned are commonly eaten, some of them daily. The enrichment of family flour and baker's bread with niacin is now common practice. The addition of niacin to milk does not seem to be the answer to the problem of correcting such niacin deficiency as exists. The public health need for addition of niacin to milk is not such as to warrant Council acceptance of milk so fortified.

A diet containing meat, eggs, green vegetables and whole grain or enriched flour and bread amply supplies the iron requirement. Despite the fact that milk is a poor source of iron, no indication is evident that the fortification of milk with iron serves a useful purpose. The restoration of iron in processed cereal foods is more definitely indicated. Those who eat the largest quantity of cereal foods are, in general, the ones who ingest the least milk. Those who include milk in their diets are usually of an economic and social status in which people generally include iron-containing foods. The public health need for fortification of milk with iron is not sufficient to justify Council acceptance of milk so fortified.

The iodine content of milk varies from a negligible amount to 2 mg. or more to the quart, depending on the iodine content of the food of the cow. Except in regions where goiter is prevalent, milk usually may be depended on to contain in each quart at least 0.1 mg., the amount stated by the Food and Drug Administration as the minimum daily requirement and also the amount which is added to the fortified milk under discussion. In regions where iodine is deficient, the addition of iodine to the diet by some means is highly desirable. It has now become a generally accepted concept that the most effective method of insuring an adequate iodine intake in regions where this element is deficient is to add iodine to some food which is eaten daily by every one. Table salt has been selected as the appropriate food. It seems unwise to sanction the addition of iodine to more than one food. Some years ago the Council published its decision that foods other than table salt fortified with iodine are not eligible for acceptance. No reason for altering this decision has developed.

Multivitamin preparations have come into general use and are now included in the U. S. Pharmacopeia. The use of milk as a vehicle for these same vitamins may seem reasonable at first thought. However, it is appropriate to consider that the use of multivitamin preparations is a therapeutic measure and is to be sanctioned only under special circumstances. The special situations which have been listed by two of the Councils of the American Medical Association (The Proper Use of Vitamins in Mixtures, THE JOURNAL, July 18, 1942, p. 948) are essentially the treatment of deficiency states, supplementation of reducing diets for obesity, supplementation of restricted diets used for the treatment of allergy, supplementation of restricted diets during convalescence from severe infections, supplementation of special diets for peptic ulcer, and infant feeding. The use of special multivitamin preparations in normal infant feeding is unnecessary. Except for infant feeding, all the situations mentioned are in the treatment of abnormal conditions. The use of multivitamin preparations in normal nutrition is not only unnecessary but conflicts with the teaching of good nutritional practice. The same logic applies to the addition of minerals to the diet. It is to be assumed that the fortified milk under consideration is intended chiefly for use in the normal diet and not primarily for treatment of abnormal states. Such use does not conform to general principles acceptable to the Council.

From the preceding discussion it is concluded that the fortification of milk with vitamin A, thiamine, riboflavin, niacin,

iron and iodine or any one of these materials does not serve a public health need sufficiently to warrant Council acceptance of the fortified product.

D-Q (DAILY QUOTA) MILK OF THE BORDEN COMPANY NOT ACCEPTABLE TO THE COUNCIL

This milk product, which is being marketed in several areas in the East, has been fortified by the addition of vitamins and minerals to contain the following amounts of these nutritional elements per quart:

Vitamin A	4,000 U. S. P. units
Vitamin D	400 U. S. P. units
Thiamine	1.0 mg.
Riboflavin	2.0 mg.
Niacin	10.0 mg.
Iron	10.0 mg.
Iodine	0.1 mg.

As shown in the foregoing report, the addition of these nutrients to milk with the exception of vitamin D is not considered to be necessary in the interest of the public health or to conform with the general principles of nutrition advocated by the Council. Therefore D-Q milk is declared not acceptable.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN E. SMITH, M.D., Secretary.

MERBROMIN (See New and Nonofficial Remedies, 1944, p. 139).

The following dosage forms have been accepted:

PREMO PHARMACEUTICAL LABORATORIES, INC., NEW YORK
Merbromin Crystals: 10 Gm., 100 Gm., 500 Gm. and 1,000 Gm. bottles.

Solution of Merbromin—N. F.: 7.5 cc., 15 cc., 30 cc., 473 cc. and 3,785 cc. bottles.

Surgical Solution of Merbromin—N. F.: 473 cc. and 3,785 cc. bottles.

VITAMIN D (See New and Nonofficial Remedies, 1944, p. 624).

The following additional dosage form has been accepted:

WINTHROP CHEMICAL CO., INC., NEW YORK

Capsules Drisdol Concentrated Solution in Oil: 5 minims. Each capsule contains 1.25 mg. of Drisdol and has a potency of 50,000 units of vitamin D (U. S. P.).

TETRACAINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1944, p. 88).

The following additional dosage form has been accepted:

WINTHROP CHEMICAL CO., INC., NEW YORK

Ampuls Pontocaine Hydrochloride "Niphanoid" for Spinal Anesthesia: 250 mg. Ampuls containing tetracaine hydrochloride in finely divided and instantly soluble form.

ESTROGENIC SUBSTANCES (See New and Nonofficial Remedies, 1944, p. 414).

The following additional dosage form has been accepted:

GEORGE A. BREON & CO., KANSAS CITY, MO.

Solution of Estrogenic Substance (in oil) with Chlorobutanol 3%: 10 cc. vial. Each cubic centimeter contains 20,000 international units of estrogenic substance and chlorobutanol 3 per cent.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO 10, ILL.

Cable Address - - - "Medic, Chicago"

Subscription price - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, OCTOBER 14, 1944

AMERICAN PUBLIC HEALTH ASSOCIATION HEALTH INSURANCE DECLARATION

At its annual meeting in New York, October 4, the Governing Council of the American Public Health Association adopted a report favoring in effect a federal plan of compulsory health insurance. The text of the adopted report appears elsewhere in this issue (page 441). This report, first prepared by a subcommittee,¹ was approved after several amendments by the association's Committee on Administrative Practice.² The proposed medical service would be supported by social insurance, supplemented by general taxation, or by general taxation alone.

The ratification of the report as amended came after extended debate in which there was opposition to the adoption and publication of the report as a stated policy of the association. Those who opposed pointed out (a) that the administration of public health in the United States was by no means so universal or so generally adequate that public health departments in general were ready for this step, (b) that before the association placed itself publicly on record in the terms of this report there should be consultation with the most interested professional groups, particularly the American Medical Association and the American Dental Association, and (c) that the publication of the subcommittee report, its approval by the Committee on Administrative Practice and the call for adoption in the Governing Council occurred within less than thirty days elapsed time, although the subcommittee had been working on the report for a year.

1. Joseph W. Mountin, M.D., chairman, Earle G. Brown, M.D., David D. Carr, M.D., Edwin F. Daily, M.D., Graham Davis, I. S. Falk, Ph.D., J. Roy Hege, M.D., Hugh R. Leavell, M.D., Emory Morris, D.D.S., George St. J. Perrott, Marion G. Randall, R.N., Edward S. Rogers, M.D., and Nathan Sinai, D.P.H.

2. Wilton L. Halverson, M.D., chairman, Haven Emerson, M.D., vice chairman, Reginald M. Atwater, M.D., secretary, Gregoire F. Amyot, M.D., Dwight M. Bissell, M.D., George B. Darling, D.P.H., Lloyd M.D., Millard C. Hanson, M.D., Ira V. Hisecock, Sc.D., J. Graves, M.D., Kenneth F. Maxey, M.D., Joseph W. Mountin, M.D., John T. Phair, M.B., D.P.H., George H. Ramsey, M.D., W. S. Rankin, M.D., Clarence L. Scamman, M.D., Marion W. Sherman, R.N., and H. A. Whittaker

The motion to adopt the report was made at the October 2 meeting of the Governing Council and was extensively debated at that time. Action was postponed until the October 4 meeting. At that time an amendment was offered to the motion to adopt. This amendment called for the Governing Council to receive this portion of the report of the Committee on Administrative Practice and to refer it to the Executive Board of the American Public Health Association with instructions to confer with the Board of Trustees of the American Medical Association and with the American Dental Association in an attempt to arrive at a statement which these three great professional groups could support. The amendment was lost by a standing vote approximately three to one after a voice vote had left the chair in doubt. The Governing Council then proceeded to vote on a motion to adopt the report; this vote was 49 Aye and 14 No. The opposition to the adoption of the report was led by Drs. Walter A. Biering, Past President of the American Medical Association, Haven Emerson and W. W. Bauer.

Now what is the group that adopted this report? Of the 7,493 members of the American Public Health Association 1,571 are Fellows. Only Fellows have a right to vote for governing councilors; the vote is conducted by ballot given to each Fellow when he registers at the meeting; Fellows not in attendance do not have a vote. The Governing Council consists of approximately 100 members, of whom 30 are elected by vote of the Fellows, 10 each year for three year terms, the rest of the members of the Governing Council hold membership by virtue of being section officers or representatives of affiliated (mostly state) public health associations. Members of the association other than Fellows can vote only on section affairs. The report on compulsory health insurance represents, therefore, the action of the subcommittee which prepared it, the Committee on Administrative Practice which approved it and the 49 members of the Governing Council who voted in its favor. Here is not a democratic practice in action; here is a shrewdly manipulated performance by full time public officials, economists, bureaucrats. Most of the names of those on the subcommittee are those of men long committed to federal compulsory sickness insurance and to federal control of all matters in the health field.

The American Public Health Association has an obvious right to express itself on any subject related to the public health. The rejection by the majority group of the proposal for consultation with medical and dental leaders indicates the attitude that may be expected of them if they should have control of the Washington bureaucracy that would dominate American medicine should their ideas become effective. Perhaps this step in which these men had leadership will be useful in

serving notice once more on the medical, dental, nursing, pharmaceutical and other professional groups as to the nature of the political manipulators in the fields of social security and public health whom the medical professions will be forced to combat.

PROLONGING THE ACTION OF PENICILLIN

Penicillin injected intramuscularly is rapidly absorbed by the local capillaries, the penicillin titer of the blood stream usually reaching its maximum within fifteen minutes. Half of the absorbed penicillin is excreted by the kidneys or otherwise removed from the circulation within the next fifteen minutes. The penicillin titer falls to one fourth of the maximum by the end of one hour and to zero by the end of two hours. To prolong the therapeutic period, repeated intramuscular injections or continuous intravenous instillations of penicillin have been tried.

Renal excretory blockade by the simultaneous injection of penicillin and diodrast or penicillin and p-aminohippuric acid have been suggested to accomplish the same purpose.¹ More recently a slowing and prolongation of penicillin absorption from the injected muscle by suspending penicillin in inert protamine, oil or wax has been tried by Romansky and his associates² of the Walter Reed General Hospital. In their initial experiments penicillin was suspended in peanut oil, sesame oil, cottonseed oil, castor oil or protamine zinc and the suspension injected intramuscularly into rabbits. A distinct prolongation of therapeutic blood titer resulted from this technic, with a parallel prolongation of penicillin excretion in the urine.

Following reported prolongation of the action of desoxycorticosterone acetate,³ histamine⁴ and heparin⁵ by the use of beeswax, Romansky suspended penicillin in a mixture of from 0.75 to 6 per cent beeswax in peanut oil. Several rabbits were injected intramuscularly with 5,000 to 10,000 Oxford units of penicillin in 1 cc. of this mixture, and an equal number of control rabbits were injected with the same number of units in saline solution. In none of the control animals was a therapeutic level of penicillin maintained in the blood for as long as two hours. In rabbits injected with the penicillin-beeswax-peanut oil mixture an adequate therapeutic level was maintained for from six to twelve hours. This is a greater prolongation of penicillin action than previously obtained with unmixed oils.

Patients were then given intramuscular injections of about 50,000 Oxford units of penicillin in 2 to 2.5 cc. of beeswax-peanut oil. In these patients an effective therapeutic blood titer was maintained for six to seven hours while penicillin excretion in the urine continued for twenty to thirty-two hours. The therapeutic efficiency of this technic was then tested on 12 patients with gonococcic urethritis, 11 of whom were cured by a single intramuscular injection with the penicillin-beeswax-peanut oil mixture. Fifty-three additional patients with gonorrhea were similarly cured by a single intramuscular injection by other members of the staff of Walter Reed General Hospital. Detailed reports are promised for the near future.⁶

PULMONARY TUBERCULOSIS OF BOVINE ORIGIN

At the London Congress on Tuberculosis in 1901 Koch asserted that bovine tubercle bacilli are virtually nonpathogenic for man and that measures to protect human populations against tuberculosis of bovine origin are unnecessary. Following repeated demonstrations by other investigators of bovine tubercle bacilli in glandular tuberculosis in children, Koch modified this view. At the Washington congress in 1908 he admitted that bovine tubercle bacilli might have sufficient virulence to cause local glandular lesions in man but still asserted that they are never sufficiently virulent to cause human pulmonary tuberculosis. By that time only 2 possible cases of human pulmonary tuberculosis of bovine origin had been reported in the literature, 1 of which was doubtful.

During the next fifteen years work by the scientific staff of the Royal Commission on Tuberculosis of Great Britain under the leadership of the late A. Stanley Griffith seemed to confirm Koch's view. Bovine tubercle bacilli were demonstrated in the sputum of only 4 of the 266 cases of human pulmonary tuberculosis examined by the British clinicians. Since then, however, the accumulated evidence has pointed to a quite different conclusion. From the sputums of 6,963 cases of human pulmonary tuberculosis in Great Britain, Griffith and his associates¹ have cultivated and identified bovine tubercle bacilli in 241 cases, or 3.4 per cent of all cases examined.

The relative frequency of bovine infections was highest in Scotland, reaching 25.8 per cent in the Orkney Islands and falling to 9.1 per cent in adjacent districts of the mainland. The average for all of Scotland was 5.2 per cent, falling to 4.4 per cent in the city of Aberdeen. In England the highest frequency (2 per

1. Penicillin Excretory Blockade, editorial, *J. A. M. A.* **126**: 369 (Oct. 7) 1944.

2. Romansky, M. J., and Rittman, G. E. *Science* **100**: 196 (Sept. 1) 1944.

3. Code, C. F.; Gregory, R. H.; Lewis, R. E., and Kotke, F. J.: *Am. J. Physiol.* **133**: 240, 1941.

4. Code, C. F., and Vareo, R. L.: *Am. J. Physiol.* **137**: 225, 1942.

5. Bryson, J. C., and Code, C. F. *Proc. Staff Meet., Mayo Clin.* **19**: 100, 1944.

6. Romansky, Monroe J., and Rittman, George E.: *Penicillin*, Bull. U. S. Army Med. Dept., October 1944, page 43.

1. Griffith, A. S., and Munro, W. T.: *J. Hyg.* **43**: 229 (Jan) 1944.

cent) was recorded in the north and middle counties, southern England yielding only 0.6 per cent.

Five of the 266 cases were double infections, the bovine bacilli being associated with tubercle bacilli of human type. Clinical and anatomic evidence, such as previous cervical or mesenteric glandular tuberculosis or bone and joint tuberculosis, was strongly in favor of the digestive tract as the usual channel of entry of the bovine bacilli. Personal histories left little doubt that raw cow's milk was the main source of infection in the majority of cases. The probability of human to human infection with the bovine bacillus was ruled out in all but 4 cases. One probable instance of infection with bovine bacilli spreading from man to cattle was recorded.

The British survey led to the conclusion that cases of tuberculosis of the lungs due to bovine tubercle bacilli are indistinguishable clinically, radiologically or by postmortem examination from cases due to the human tubercle bacilli. From this Griffith concludes that human and bovine tubercle bacilli are equally pathogenic for man. This is but a belated endorsement of the opinion long held by American pathologists, many of whom² believe that the bovine bacillus is often more highly virulent for man than the average human strain.

Griffith closes his posthumous report with a plea for avoidance of the consumption of raw milk in Great Britain, which is currently causing an estimated annual loss of 2,000 human lives in Scotland and England, two thirds of them of children under 15 years of age.³

THE REVERSIBILITY OF HEART DISEASE

Recently Dr. Paul Dudley White¹ called attention to the extent of the reversibility of heart disease in the annual oration in medicine before the Illinois State Medical Society. Twenty years ago Hamilton and Lahey² proved that serious thyrocardiac disease, now almost unknown, could be dispelled by subtotal thyroidectomy; the cardiac enlargement and failure in such cases had previously been considered risks too hazardous for surgery. Since that time every kind of heart disease has been shown to be reversible, in at least a small proportion of cases, either spontaneously or by surgical or medical treatment. This is a different situation from that recalled by White, who states that some thirty years ago when he was medical student, intern and hospital resident "it was still being taught and believed that heart disease was final and fatal, that the coronary arteries were forever 'end arteries'

and that at best we could simply delay a little the day of dissolution and make a bit more comfortable the remaining hours of the victims."

Following the demonstration of the reversibility of thyrotoxic heart disease and of the cardiac enlargement of myxedema, the reversibility of various other conditions has been proved. In 1928 the first case in this country of cure of chronic constrictive pericarditis by pericardial resection was carried out by Churchill; since that time relief has been given in many other cases. Some ten years ago it was realized that cardiac dilatation due to acute rheumatic myocarditis could entirely subside with the disappearance of mitral diastolic as well as of mitral systolic murmurs. Aneurysms, sacular and arteriovenous, have been attacked successfully by wiring or excision. Coronary heart disease, one of the most important of all types, has been shown to be reversible also, primarily through the spontaneous development of an adequate collateral circulation. Thus myocardial infarction and indeed also angina pectoris in many cases may exist merely as acute or subacute illnesses and not necessarily as chronic disabilities. The acute cor pulmonale consisting of dilatation of the right heart chambers may quickly subside on recovery from the immediate effects of massive pulmonary embolism. Cardiac dilatation and even failure found in acute hemorrhagic nephritis, avitaminosis of the B₁ type and severe anemia may also subside, with recovery from these underlying diseases.

Six years ago congenital heart disease joined the ranks of the types of reversible heart disease, when Gross³ of Boston successfully ligated the patent ductus arteriosus; since then, in a good many cases, cardiac strain and dilatation have been relieved by this procedure. Subacute bacterial endocarditis has been yielding slowly but definitely to chemotherapy, first in slight degree to the sulfonamides and now apparently more successfully to massive doses of penicillin. Finally, the last of the types which was thought not long ago to be particularly irreversible, namely hypertensive heart disease, is now being relieved on occasion by the more extensive splanchnic resection carried out by Smithwick.⁴

Dr. White concludes: "Where does this all lead us? In two directions: first and most obviously, along our continued optimistic search for still further chances and methods of reversing the evidences of heart disease, and second and still more importantly, in our attacks on the causes of heart disease, such as hypertension, before the heart itself is affected. That is our ultimate goal in cardiology, as in all fields of medicine, prevention rather than cure!"

2. Reichle, H. S.: Primary Tuberculous Infection of the Intestine, Arch. Path. 21: 79 (Jan.) 1936.

3. Jordan, L.: Medical Research Council, Special Report Series 184, London, H. M. Stationery Office, 1933.

1. White, Paul D.: The Reversibility of Heart Disease, Illinois M. J. 86: 9 (July) 1944.

2. Hamilton, Burton E.: Heart Failure of the Congestive Type Caused by Hyperthyroidism, J. A. M. A. 83: 405 (Aug. 9) 1924. Lahey, F. H.: End Results in Thyrocardiacs, Ann. Surg. 90: 750 (Oct.) 1929.

3. Gross, R. E., and Hubbard, J. P.: Surgical Ligation of a Patent Ductus Arteriosus: Report of First Successful Case, J. A. M. A. 112: 729 (Feb. 25) 1939.

4. Smithwick, R. H.: A Technique for Splanchnic Resection for Hypertension. Preliminary Report, Surgery 7: 1 (Jan.) 1940.

Current Comment

SHOCK THERAPY FOR DEMENTIA PRECOX

Patients with dementia precox treated by insulin shock at the Brooklyn State Hospital, New York, did substantially better in all respects than comparable patients who did not receive any form of shock therapy. This fact, based on a study of 1,128 patients with dementia precox treated with insulin shock therapy and 876 not treated with shock therapy was embodied in a report recently submitted by the Temporary Commission on State Hospital Problems in New York State.¹ Among the benefits of insulin shock treatment was the consistently higher proportion of insulin treated patients who were returned to gainful employment. A much larger proportion of the treated patients were able to leave the hospital; the hospitalization period prior to release was 3.8 months shorter per patient among the insulin treated group than among the nontreated. The report pointed out that insulin treatment thus effected a saving of 286,695 days of hospital care. The recommendation of the commission was that insulin shock therapy should be made available to all patients with dementia precox in state hospitals in New York.

ASCORBIC ACID FOR BLEEDING GUMS

A number of reports have indicated that ascorbic acid is valuable for various forms of gingivitis and bleeding gums. Consequently vitamin C frequently has been administered for that purpose. The Royal Air Force, for example, has used large quantities for the treatment of all forms of bleeding gums. Now a report has appeared based on an investigation carried out between October 1941 and May 1942 to discover the incidence of bleeding gums in the Royal Air Force and to evaluate the use of ascorbic acid in the treatment of this condition. The total number of personnel under investigation was 2,962 at four stations. Of these, 588 had some degree of bleeding of the gums, or a percentage of 19.8. The gums of the lower jaw were examined for bleeding after digital massage. Bleeding was recorded as of three degrees: (a) bleeding just perceptible at one or two points after firm massage, (b) bleeding more easily produced or bleeding from several points and (c) bleeding apparent on inspection or at the slightest touch. An average amount of ascorbic acid present in the food served to the airmen at three of the stations was 25.8 mg. per man daily during October and November 1941 and 16.8 mg. during March 1942. Alternate members of the group with bleeding gums were given ascorbic acid tablets and dummy tablets. The dose was 200 mg. of ascorbic acid daily for seven days followed by 100 mg. daily for fourteen days. Of one group of men with bleeding gums, 250 completed the test, 119 receiving ascorbic acid and 131 receiving dummy tablets. There was no greater improvement in the gum conditions observed in those treated with

ascorbic acid than in those who received the control tablets. In one of the stations, observations were carried out on 600 men over a six weeks period. There was a large normal variation in the degree of bleeding of the gums, irrespective of treatment. Those having "sponginess" as well as bleeding of the gums did not show any greater improvement with ascorbic acid treatment than with dummy tablets. The personal opinions of patients with regard to the degree of bleeding from the gums and effectiveness of treatment did not bear any relation to the objective signs. Stamm and his colleagues¹ concluded that greater improvement in the gum condition was not obtained by treatment with ascorbic acid than with dummy control tablets. In view of the shortages in vitamin C supplies, it seems advisable to use ascorbic acid in the future with more discrimination. Large supplementary doses may be limited to those conditions for which scientifically acceptable evidence establishes the value of vitamin C.

TRANSLATION OF MEDICAL BOOKS FOR LATIN AMERICAN USE

Important books of this country, particularly in the fields of science, medicine and technology, will be made more readily available in Spanish and Portuguese translations for peoples of the other American republics as the result of a project to be conducted by Science Service, the nonprofit scientific institution, as a part of the Department of State's broad program for intellectual cooperation in the Western Hemisphere. Spanish and Portuguese translations of American books, issued by publishers in the other American republics as well as by United States publishers, will receive financial aid under this project. Books originally published in Spanish and Portuguese will be made available in English in the United States under provisions for similar aid to United States publishers. A grant-in-aid by the Department of State provides Science Service with funds to help defray the costs of translations, to obtain and distribute copies of the translated books to libraries, institutions and other organizations and to cooperate otherwise in making the literature of any one American republic available to other peoples on the two continents. The purpose of this two way translation program is "to overcome the barriers raised by difference of language by making available to the peoples of the other American republics the writings which represent the thought and the cultural and intellectual life of the United States, and making available to the people of the United States the writings which represent the thought and cultural and intellectual life of the peoples of the other American republics." Suggestions as to translations needed are being received from officials, scientists, educators, publishers and others in this country and the other American republics. This program should contribute materially to the increasing interdependence and good will of physicians and scientists in our own country and in our sister republics.

1. Temporary Commission on State Hospital Problems, Aug. 27, 1944

1. Stamm, W. P., Macrae, T. F., and Yudkin, Simon. Incidence of Bleeding Gums Among R. A. F. Personnel and the Value of Ascorbic Acid in Treatment. *Brit. M. J.* 2: 239 (Aug. 19) 1944.

MEDICINE AND THE WAR

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

POLICY STATEMENT

Paul V. McNutt, chairman of the War Manpower Commission, issued the following statement on the policy adopted by the directing board of the Procurement and Assignment Service of the War Manpower Commission at a meeting on September 23:

"The war is not yet over and we must continue our efforts to keep the armed services supplied with a sufficient number of doctors, dentists and nurses to meet the critical needs of this period of the war and also fulfil our obligation to the home front.

"In common with the other divisions of the War Manpower Commission, however, the Procurement and Assignment Service is cooperating with those charged with the responsibility for developing demobilization plans. In view of the information collected incident to the mobilization of our medical resources for war, this office can perform many useful services in connection with these demobilization plans in the interest of the members of the professions now in service. The War Manpower Commission wishes to be of whatever service possible but, in common with all war agencies, has no interest in perpetuating its controls beyond the period necessary."

In order that the point of view of the directing board of the Procurement and Assignment Service may be understood by

the doctors, dentists, veterinarians, sanitary engineers and nurses, the following statement of policy was adopted at its meeting on September 23:

1. The Procurement and Assignment Service is an organization which was created at the request of these professions to meet a war problem, and in meeting its responsibilities this service has had the support of these professions.

2. As a war agency this service is discharging and will continue to discharge its obligations until the end of the war. It will cooperate with the agencies concerned with the effective utilization of the individual members of these professions who are demobilized before the end of the war.

3. In the directive under which it was created, the responsibilities of the Procurement and Assignment Service did not extend beyond the duration of the war.

4. Therefore it does not contemplate dealing with peacetime demobilization but will continue its activities, including cooperation with agencies working on demobilization plans, so long as the war continues.

The members of the directing board are Drs. Frank H. Lahey, chairman, Harvey B. Stone, vice chairman, C. Willard Camalier Jr., Harold S. Diehl, James E. Paullin and Abel Wolman.

NAVY

NAVY RELIEF SOCIETY ASSISTANCE IN MEDICAL CARE OF NAVAL DEPENDENTS

The primary purpose of the Navy Relief Society, incorporated Jan. 23, 1904 under the Laws of the District of Columbia, is to assist, in time of emergency need, the widows, minor orphans and dependent mothers of deceased men of the Navy and Marine Corps. It is also its purpose, in cases of emergent need, to help active servicemen provide hospital, medical and surgical care for their dependents when they and their families are unable to do so with their own resources. This financial assistance takes the form of a loan, without interest, or a gratuity, or a combination of the two, depending on the man's ability to repay a loan without undue hardship.

The Navy Relief Society is not a government agency. Its funds are raised by voluntary contributions, largely from service personnel, except that the general public contributed during the year 1942.

The society deems it unwise to make loans that cannot be repaid, and its funds are not adequate to permit it to assume the obligation to advance, as a gratuity, sufficient funds to pay in full normal medical and surgical fees, but it does desire to help the serviceman to meet such emergency needs of his dependents.

It is the policy of the society to help active servicemen secure hospital (open ward rates), medical and surgical care for their dependents in cases of other than chronic illness, provided (a) the serviceman and his family do all that they can to meet their own obligations, (b) the resources of the community are utilized as far as possible, without prejudice to the status of the family prior to the man's entry into the service, and (c) the application for assistance has been approved by the Navy Relief Society before the services are rendered, except in emergency cases, when application must be made within forty-eight hours to the Navy Relief Society directly, through its auxiliaries or through the American Red Cross.

The Navy Relief Society may, after full consideration of the facts of the case, help a serviceman provide hospital, medical

and surgical care for his dependents, but it cannot (a) accept the obligation to advance as a gratuity (gift) sufficient funds to pay in full normal medical and surgical fees, (b) pay bills for operations or medical care in chronic cases or (c) pay hospital, medical or surgical bills contracted without its knowledge or approval, except under conditions stated in c in the preceding paragraph.

It is expected that physicians and surgeons will arrange with the family for the payment of their fees. When the dependent or the man concerned needs assistance, application should be made by the man or his dependent to the Navy Relief Society directly or through its auxiliaries or through the American Red Cross prior to creating the obligation.

The society will usually agree to assist, but the extent to which the society is able to assist is limited and will be based on the full consideration of all the facts in the case. As a rule the assistance will be rendered by sending to the patient, for delivery to the physician or surgeon, a check drawn in favor of the physician or surgeon.

CAPTAIN ALPHONSE McMAHON HONORED

Capt. Alphonse McMahon, St. Louis, recently returned from eighteen months' service in the South Pacific and is now on duty at the U. S. Naval Hospital at the National Naval Medical Center, Bethesda, Md. He was recently honored by the Mississippi Valley Medical Society as its distinguished service award recipient for 1944. The award, a gold medal and certificate, was presented by the society's president, Dr. C. Paul White, September 27. The citation accompanying the award read, in part, "To Captain Alphonse McMahon of St. Louis, Medical Corps, U. S. Navy, for his long service as a teacher of clinical medicine at St. Louis University Medical School; for his continuous interest in postgraduate medical education, in recognition of which he was elected Vice President of the American Medical Association and President of the St. Louis Medical Society a few years ago, and for his fine example as a citizen of the United States by leaving a lucrative private practice promptly on declaration of World War 2 and entering the

U. S. Navy although over the draft age. Here he spent eighteen months in the South Pacific in the establishment of one of the first hospitals to receive combat injured from the battles of the Coral Seas and Guadalcanal, in recognition of which he has been cited by Admiral William F. Halsey as a naval officer who has 'reflected great credit on himself by his outstanding professional ability and keen judgment, particularly in the management of war wounds and in the treatment of tropical diseases. His long experience as a teacher of medicine and his effective leadership in the instruction of young medical officers contributed materially to the success of the Navy's operations.'

NAVY AWARDS AND COMMENDATIONS

Lieutenant Mark Walton Wolcott

Lieut. Mark Walton Wolcott, formerly of Philadelphia, was recently awarded the Air Medal "for meritorious achievement in aerial flight as crew member of an R4D transport plane attached to the South Pacific Air Transport command from July 15 to 25, 1943. When his craft was unable to land on the densely overgrown jungle terrain while transporting urgently needed supplies to our forces on New Georgia Island, Lieutenant Wolcott skilfully performed his duties and rendered invaluable assistance to his pilot in accurately dropping the cargo as the unarmed plane flew in at terrific speed and at tree top level to avoid intense enemy antiaircraft fire and aerial opposition, making several hazardous runs on the targets to complete the mission and frequently returning to base with-

out the protection of covering planes. Lieutenant Wolcott's cool courage and unwavering devotion to duty under extremely difficult conditions contributed materially to the success of these vital missions and were in keeping with the highest traditions of the United States Naval Service." Dr. Wolcott graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1941 and entered the service July 15, 1942.

Lieutenant Commander David Charles James

The Navy and Marine Corps Medal was recently awarded to Lieut. Comdr. David Charles James, formerly of East Cleveland, Ohio. The citation read "For heroic conduct as medical officer aboard the LST-396 when that ship with a cargo of gasoline and ammunition was attacked and sunk by enemy Japanese forces in the New Georgia Area on Aug. 18, 1943. Despite recurrent explosions and spreading flames, Lieutenant Commander (then Lieutenant) James disregarded imminent personal danger and entered a troop berthing compartment, under which the powder and gasoline had been stored, to save a helpless shipmate pinned under a mass of twisted wreckage. Bringing the severely injured man topside, he swiftly performed an emergency amputation in the midst of enveloping smoke and flames and then assisted in getting him over the side and into a life raft, where he applied a tourniquet and administered to the wounded comrade until rescued. Lieutenant Commander James's outstanding valor, his professional integrity and selfless devotion to duty were in keeping with the highest traditions of the United States Naval Service." Dr. James graduated from New York University College of Medicine, New York, in 1939 and entered the service July 14, 1941.

ARMY

NEW MEDICAL PLAN FOR AAF COMMANDS

A new program of industrial medicine and hygiene, developed by the medical staff of the Air Technical Service Command, will be installed in all AAF commands in the United States. The program, instituted by Col. J. M. Hargreaves, ATSC surgeon, is being taught and demonstrated to medical officers from other AAF commands in five twelve day seminars, which opened recently at five depots of the ATSC under a standardized plan developed by Colonel Hargreaves and Lieut. Col. Grover Sladczyk, chief, Industrial Hygiene Branch. One hundred leading medical officers from the AAF Training Command, the Second, Third and Fourth Air Forces and the Air Transport Command are attending the seminars conducted at Middletown, Pa., Ogden, Utah, Oklahoma City, San Antonio and Warner Robins, Ga. The program has been endorsed by the American Medical Association and the American College of Surgeons. Simultaneous conduct of the seminars was decided on, Colonel Hargreaves stated, in order to facilitate installation of the ATSC program in other commands as quickly as possible, following receipt of an order to that effect from Major Gen. David N. W. Grant, Air Surgeon, Washington, D. C. Lectures on more than fifty subjects will be followed by demonstrations and tours around each of the ATSC depots. On completion of the course the AAF medical officers will return to their respective commands to begin immediate installation of the ATSC program.

CONTROLLED RATION TEST COMPLETED

The most extensive controlled ration test ever conducted using U. S. military personnel was recently concluded with highly satisfactory results. Major William Beane of the Armored Medical Research Laboratory, Fort Knox, Kentucky, directed the test in cooperation with Major James Robinson, Inf., and Capt. David Bell of the Royal Canadian Medical Corps. American and Canadian expeditionary rations were used.

A battalion of American soldiers on maneuvers at an altitude of 8,850 feet above sea level in Colorado were fed exclusively on American rations C, K and 10 in 1 and Canadian Mess Tin B ration for a period of sixty days. During this time they were engaged in vigorous combat training. At the conclusion of the

test it was found that the troops were in better physical condition than at the start, with high morale. The rations were proved to be wholly adequate to sustain troops in vigorous combat. Certain items in the rations, however, were found less acceptable to the men than others, and these will be improved.

Four consultants in nutrition to the Surgeon General, Dr. Julian M. Ruffin, Dr. Frederick J. Stare, Dr. R. H. Kampmeier and Dr. Virgil P. Sydenstricker, assisted in the physical examinations. Dr. Albert Mendeloff and Dr. Carleton B. Chapman of the Public Health Service also aided in the test. A unit from the Harvard Fatigue Laboratory under Dr. R. E. Johnson performed the laboratory examinations.

HONOR BRIGADIER GENERAL JAMES S. SIMMONS AT MARQUETTE UNIVERSITY

An honorary degree of Doctor of Science was recently bestowed on Brig. Gen. James S. Simmons, U. S. Army, at Marquette University School of Medicine, Milwaukee. Dr. Eben J. Carey, dean at the school, stated that "Brigadier General James Stevens Simmons, U. S. Army, doctor of medicine from the University of Pennsylvania in 1915, doctor of philosophy from George Washington University in 1934, doctor of public health from Harvard University in 1939, lecturer in preventive medicine and public health at Johns Hopkins, George Washington and Yale universities, member of the visiting committee for the Harvard University School of Public Health, chief and director of various army laboratories and schools from 1917 to 1940, chief, Preventive Medicine Service, Office of the Surgeon General, U. S. Army, since 1940, subchairman on the Lehman Committee, director of the Philippine Research Board of Manila from 1928 to 1930, president of the National Malaria Committee in 1942, member and fellow of many medical associations and committees, awarded the Sedgwick Memorial Medal in 1943, the medal of the Carlos J. Finley National Order of Merit in 1944, and for 'exceptionally meritorious services' in the United States of America Typhus Commission Medal in 1944, by his many distinct contributions to medical science, is entitled to the degree Doctor of Science, honoris causa." General Simmons was represented by Rev. Edward J. Drummond, S.J., Ph.D., dean of the Graduate School.

MEDICAL ADMINISTRATIVE CORPS OFFICERS

In order to relieve the critical shortage of doctors, the Medical Department recently increased its quota for admission to officer candidate schools and is continuing a program of training graduate administrative officers as battalion surgeon assistants. From now until April 1945 appointments will be made in the Medical Administrative Corps after seventeen weeks' training at Camp Barkeley, Texas, and Carlisle Barracks, Pa. From among those graduates, officers with appropriate backgrounds will be selected to receive six weeks' additional training at Camp Barkeley for duty assisting battalion surgeons.

The special training consists principally of advanced first aid which will qualify officers to relieve battalion surgeons of details and thus free the surgeons' time for purely medical and surgical work.

The thirty-second class of the Camp Barkeley Medical Administrative Corps Officer Candidate School graduated September 20. At the present time there are four other classes in various stages of the seventeen weeks instruction. Courses of instruction at the school include medical administration, supply, organization of the army, sanitation, first aid, chemical warfare, tactics, training and logistics. Brig. Gen. Roy C. Heflebower is commandant of the school.

MISCELLANEOUS

POSTWAR MEDICAL SERVICE COMMITTEE'S QUESTIONNAIRES

At the request of the Committee on Postwar Medical Service, questionnaires designed to gather information that would be useful for postwar planning were distributed by the Surgeons General of the Army, Navy and Public Health Service to each medical officer on active duty. Letters have been received from a number of medical officers indicating that they did not receive a questionnaire. In the event any medical officer did not receive a Postwar Planning Questionnaire, it is suggested that he write to the Committee on Postwar Medical Service, 535 North Dearborn Street, Chicago 10, and request one.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Camp McCoy, Wisconsin: Psychiatry, Psychoneurosis, Neurocirculatory Asthenia and Malingering, Dr. Lloyd H. Ziegler, November 1.

U. S. Naval Hospital, Santa Margarita Ranch, Oceanside, Calif.: Audiovisual Kinesthetic Methods in the Rehabilitation of the War Deafened, Lucelia M. Moore, October 16.

Truax Field, Wisconsin: Peptic Ulcer and Gastritis, Dr. Carl W. Eberbach, November 1.

U. S. Naval Hospital, Long Beach, Calif.: Some Aspects of the Treatment of Peptic Ulcer, Dr. William C. Boeck, October 21.

An extensive lecture tour of the various military hospitals in Kentucky and Tennessee will be made by Dr. Louis A. Buie of the Mayo Clinic under the auspices of the Wartime Graduate Medical Meetings. His topics for discussion will be "Anal Abscess and Fistula," "Anal Fissure, Hemorrhoids and Stricture," "Pilonidal Disease" and "Lesions of the Terminal Portion of the Colon." The schedule to be followed is Nichols General Hospital on the 9th of October, Fort Knox on the 10th, Camp Breckenridge on the 11th, Camp Campbell on the 12th, Nashville Army Air Center on the 13th, Camp Forrest on the 14th, Thayer General Hospital on the 16th, Kennedy General Hospital on the 17th and Dyersburg Station Hospital on the 18th.

NURSING IN THE UNITED STATES PUBLIC HEALTH SERVICE

Katharine S. Read, superintendent of nurses, United States Public Health Service, in supplement 176 to *Public Health Reports*, gives an outline of the service since it was established in 1798 by act of Congress as the Marine Hospital Service. That name was used for more than a century, or until 1902, when it was changed to the Public Health and Marine Hospital Service and in 1912 was changed to its present name. For many years the duty of caring for American merchant seamen was the sole function of the Marine Hospital Service,

and nursing in the marine hospitals was done largely by male nurses. In 1918 the Surgeon General of the Public Health Service requested the American Red Cross to detail a nurse to survey the marine hospitals for the purpose of making a report on the nursing situation. Miss Lucy Minnigerode was assigned to make this survey. The Surgeon General was so impressed with her report that he recommended that she be appointed superintendent of nurses of the U. S. P. H. S. This was effective in 1919. On March 3, 1919 the Public Health Service was authorized to furnish medical service to veterans.

Since Pearl Harbor the Public Health Service has expanded greatly. The increase in the Coast Guard and the activities of the War Shipping Administration have developed an entirely new activity. Nurses have been assigned to act as instructors in nursing arts at the Pharmacist's Mates School of War Shipping Administration, Sheepshead Bay, Brooklyn. This school takes in a class of fifty trainees each week for a course of three months.

The functions of the nursing service are to provide nursing care to all service beneficiaries in the hospitals and dispensaries of the service and related projects and to instruct trainees of the Maritime Service and the Coast Guard in nursing arts both in the pharmacist's mates school and in the hospital wards.

Those entitled to hospital care by the Public Health Service include seamen, Coast Guard, Coast and Geodetic Survey: officers, ships' officers, and crews of coast and geodetic survey vessels; persons with leprosy, U. S. Employees' Compensation Commission beneficiaries, Public Health Service officers and employees (quarantine and field), immigration and naturalization service (persons detained under immigration laws and regulation), special study cases and pay patients.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, October 7, page 374)

MASSACHUSETTS

Boston City Hospital, Boston. Capacity, 2,537; admissions, 40,314. Dr. James W. Manary, Medical Director and Superintendent (2 residents—dermatology and syphilology).

NEW YORK

Cumberland Hospital, Brooklyn. Capacity, 400; admissions, 6,205. Dr. Max Seide, Medical Superintendent (14 interns, July 1, 1945). St. John's Long Island City Hospital, Long Island City. Capacity, 284; admissions, 5,418. Sister Thomas Francis, Superintendent (interns). Genesee Hospital, Rochester. Capacity, 256; admissions, 5,981. Dr. Leslie H. Wright, Superintendent (resident—medicine). St. John's Riverside Hospital, Yonkers. Capacity, 220; admissions, 4,398. Dr. John W. Pangburn, Chairman, Intern Committee (interns).

OHIO

Longview Hospital, Cincinnati. Capacity, 2,827; admissions, 482. Dr. E. A. Baber, Superintendent (3 residents—psychiatry).

ORGANIZATION SECTION

MEDICAL CARE IN A NATIONAL HEALTH PROGRAM

*The following amended report was adopted by the Governing Council of
The American Public Health Association
at its annual meeting, held in New York on October 4:*

A. THE NEEDS

I. A large portion of the population receives insufficient and inadequate medical care, chiefly because persons are unable to pay the costs of services on an individual payment basis when they are needed, or because the services are not available.

II. There are extensive deficiencies in the physical facilities needed to provide reasonably adequate services. Such facilities include hospitals, health centers and laboratories. The needs are most acute in poor communities, in rural areas and in urban areas where the population has increased rapidly or where the development of facilities has been haphazard or the financial support inadequate.

III. There are extensive deficiencies in the numbers and the distribution of personnel needed to provide the services. Here again the needs vary according to types of personnel and to types of communities.

IV. There are extensive deficiencies in the number and types of personnel qualified to administer facilities and services.

V. Many communities still are not served by public health departments; others inadequately maintain such departments. Thus, some communities have never utilized organized health work to reduce the burden of illness and others share its benefits only in part. In these communities especially, people lack information on the benefits of modern medical care.

VI. Expansion of scientific research is urgently needed. Despite past and current scientific advances, knowledge as to the prevention, control or cure of many diseases is lacking.

Each of the six conditions defined above can be broken down into many component parts representing specific needs. In general, however, solutions of these broad problems require simultaneous attack on four fronts: namely, the distribution of costs, construction of facilities, training of personnel and expansion of knowledge.

B. THE OBJECTIVES

I. A national program for medical care should make available to the entire population all essential preventive, diagnostic and curative services.

II. Such a program should insure that the services provided be of the highest standard and that they be rendered under conditions satisfactory both to the public and to the professions.

III. Such a program should include the constant evaluation of practices and the extension of scientific knowledge.

C. RECOMMENDATIONS

The recommendations presented in this report represent guides to the formulation of a policy for action. It is believed that study of these recommendations by the professions and others concerned in the states and localities will produce new and more specific recommendations for the attainment of the objectives of a national health program.

Recommendation I. The Services

a. A national plan should aim to provide comprehensive services for all the people in all areas of the country. In light of present day knowledge, the services should include hospital care, the services of physicians (general practitioners and specialists), supplementary laboratory and diagnostic services, nursing care, essential dental services, and prescribed medicine and appliances. These details of content must remain subject to alteration according to changes in knowledge, practices and organization of services.

Because of inadequacies in personnel and facilities, this goal cannot be attained at once, but it should be attained within ten

years. At the outset, as many of the services as possible should be provided for the nation as a whole, having regard for resources in personnel and facilities in local areas. The scope of service should then be extended as rapidly as possible, accelerated by provisions to insure the training of needed personnel and the development of facilities and organization.

b. It is imperative that the plan include and emphasize the provision of preventive services for the whole population. Such services include maternity and child hygiene, school health services, control of communicable diseases, special provisions for tuberculosis, venereal diseases and other preventable diseases, laboratory diagnosis, nutrition, health education, vital records and other accepted functions of public health agencies, which are now provided for a part of the population.

c. Insofar as may be consistent with the requirements of a national plan, states and communities should have wide latitude in adapting their services and methods of administration to local needs and conditions.

Recommendation II. Financing the Services

a. Services should be adequately and securely financed through social insurance supplemented by general taxation, or by general taxation alone. Financing through social insurance alone would result in the exclusion of certain economic groups and might possibly exclude certain occupational segments of the population.

b. The services should be financed on a nationwide basis in accordance with ability to pay, with federal and state participation and under conditions which will permit the federal government to equalize the burdens of cost among the states.

Recommendation III. Organization and Administration of Services

a. A single responsible agency is a fundamental requisite to effective administration at all levels—federal, state and local. The public health agencies—federal, state and local—should carry major responsibilities in administering the health services of the future. Because of administrative experience and accustomed responsibility for a public trust, they are uniquely fitted among public agencies to assume larger responsibilities and to discharge their duties to the public with integrity and skill. The existing public health agencies, as now constituted, may not be ready and may not be suitably constituted and organized, in all cases, to assume all of the administrative tasks implicit in an expanded national health service. Public health officials, however, should be planning to discharge these larger responsibilities and should be training themselves and their staffs. This preparation should be undertaken now because, when the public comes to consider where administrative responsibilities shall be lodged, it will be influenced in large measure by the readiness for such duties displayed by public health officers and by the initiative they have taken in fitting themselves for the task.

b. The agency authorized to administer such a program should have the advice and counsel of a body representing the professions, other sources of services and the recipients of services.

c. Private practitioners in each local administrative area should be paid according to the method they prefer, i. e., fee-for-service, capitation, salary or any combination of these. None of the methods is perfect; but attention is called to the fact that fee-for-service alone is not well adapted to a system of wide coverage.

d. The principle of free choice should be preserved to the population and the professions.

c. State departments of health and other health agencies are urged to initiate studies to determine the logical and practical administrative areas for a national medical care plan.

Recommendation IV. Physical Facilities

a. Preceding, or accompanying, the development of a plan to finance and administer services, a program should be developed for the construction of needed hospitals, health centers and related facilities, including modernization and expansion of existing structures. This program should be based on federal aid to the states and allow for participation by voluntary as well as public agencies, with suitable controls to insure the economical and communitywide use of public funds. The desirability of combining hospital facilities with the housing of physicians' offices, clinics and health departments should be stressed.

b. Federal aid to the states should be given on a variable matching basis in accordance with the economic status of each state.

c. Because of its record of experience and accomplishment in this field, the U. S. Public Health Service should administer the construction program at the federal level, in cooperation with the federal agencies responsible for health services and construction.

d. Funds available under this program should be granted only if:

(1) The state administrative agency has surveyed the needs of the state for hospitals, health centers and related facilities and has drawn up a master plan for the development of the needed facilities (taking account of facilities in adjacent states); or, in the absence of a state plan, the project is consistent with surveys of construction needs made by the U. S. Public Health Service;

(2) The proposed individual project is consistent with the master plan for the state; its architectural and engineering plans and specifications have been approved by the state agency and/or the U. S. Public Health Service, and there is reasonable assurance of support and maintenance of the project, in accordance with adequate standards.

e. State health departments are urged to conduct studies to develop state plans for the construction of needed hospitals, health centers and related facilities. Such studies should be made in cooperation with official health agencies, with state hospital associations and other groups having special knowledge or interests.

Recommendation V. Coordination and Organization of Official Health Agencies

a. The activities of the multiple national, state and local health agencies should be coordinated with the services provided by a national program. There is no functional or administrative justification for dividing human beings or illnesses into many categories to be dealt with by numerous independent administrations. It is difficult to reorganize agencies or to combine activities, and this cannot be accomplished hurriedly. Therefore, studies and conferences should be undertaken without delay at the federal level and in those states and communities where the health structure is already unnecessarily complex.

b. The federal and state governments should provide increased grants for the extension of adequate public health organization to all areas in all states. Increased federal grants should be made conditional upon the requirement that public health services of at least a specified minimum content shall be available in all areas of the state.

Recommendation VI. Training and Distribution of Service Personnel

a. Within the resources of the program, financial provisions should be made to assist qualified professional and technical personnel in obtaining postgraduate education and training.

b. The plan should provide for the study of more effective use of auxiliary personnel (such as dental hygienists, nursing aides and technicians) and should furnish financial assistance for their training and utilization.

c. Professional and financial stimuli should be devised to encourage physicians, dentists, nurses and others to practice in rural areas. Plans to encourage the rational distribution of personnel, especially physicians, should be developed as quickly as possible in view of the coming demobilization of the armed forces. Such plans should be integrated with the whole scheme of services and the establishment of more adequate physical facilities.

Recommendation VII. Education and Training of Administrative Personnel

a. Education and training of administrative personnel should be encouraged, financially and technically, especially for those who may serve as administrators of the medical care program, for hospital and health center administrators and for nursing supervisors.

b. State health departments should utilize training funds that are now available to train personnel in such technics as administration of health and medical services, and hospitals. Such a training program may contribute more than any other single activity to the future role of the official public health agency. As a corollary, the attention of schools of public health is directed to the importance of establishing the necessary training courses.

Recommendation VIII. Expansion of Research

a. Increased funds should be made available to the U. S. Public Health Service, to other agencies of government (federal, state and local) and for grants-in-aid to nonprofit institutions for basic laboratory and clinical research and for administrative studies and demonstrations designed to improve the quality and lessen the cost of services.

b. The research agencies and those responsible for making grants-in-aid should be assisted by competent professional advisory bodies to insure the wise and efficient use of public funds.

The American Public Health Association through its national organization and its constituent societies stands ready to collaborate with the various professional bodies and civic organizations who may be concerned with either the provision or receipt of medical service with a view to implementing the foregoing general principles.

WASHINGTON LETTER

(From a Special Correspondent)

Oct. 9, 1944.

Honorary Consultants of the Army Medical Library

Sixty physicians who met here on October 5 and 6 to organize the honorary consultants of the Army Medical Library heard Archibald MacLeish, librarian of Congress, describe the projected Holmes Memorial and the location, nearby, of the new Army Medical Library Building, to be built after the war. Plans are by Eggers and Higgins, architects of the National Gallery of Art and the Thomas Jefferson Memorial. Col. Harold W. Jones, M. C., director, presided, and Major Gen. George F. Jones greeted consultants for the Surgeon General. Colonel Jones said that one of the difficult tasks was recruiting adequate personnel, as the library, because of special requirements, could

not find suitable staff under Civil Service recruiting. Miss Mary Louise Marshall of the committee on new classification, Wyllis Wright, cataloguing consultant, Major Thomas E. Keys, Sn. C., and Dr. Max Fisch of the Cleveland branch discussed technical aspects. Keyes D. Metcalf, director of the Harvard University libraries, described the recent survey and Dr. Thomas S. Cullen reviewed legislation.

Dr. O. H. Perry Pepper was toastmaster at a dinner in the Statler Hotel, at which Dr. Morris Fishbein, Editor of *THE JOURNAL*, said that, in view of the necessity "of making the library a living bibliographical force for medical research," private funds might be obtained to supplement the regular appropriation from Congress. Dr. Reginald Fitz of Harvard University discussed the history of medicine, with special reference to the book by Henry I. Bowditch, published in 1800.

Dr. John F. Fulton, professor of physiology and librarian of the Historical Library at the Yale School of Medicine, was elected president of the honorary consultant group, Dr. Chauncey D. Leake, vice president and dean of the University of Texas School of Medicine, vice president, Colonel Jones secretary-treasurer and Dr. Clyde L. Cummer of Cleveland, Dr. Willburt C. Davison, dean of the School of Medicine of Duke University, Dr. Henry R. Viets, librarian of the Boston Medical Library and Dr. Morris Fishbein Executive Committee members.

American Medicine Aware of Its Responsibility

Optimism for the future of medicine in the United States was expressed by Dr. John H. Fitzgibbon of Portland, Ore., chairman of the Council on Medical Service and Public Relations of the American Medical Association, at the sixteenth annual scientific assembly of the District of Columbia Medical Society. He expressed his confidence in the "sincerity and unselfishness of the medical profession and their adaptability to any situation." American medicine, he said, is "the best in the world today," which, he said, American doctors took pride "in maintaining at its high level while at the same time recognizing and admitting its inadequacies." The medical profession, he said, is cognizant of the evil effects on a community and nation of ill health, poor housing, malnutrition, congestion, economic insecurity, unemployment, lack of cultural development, intolerance and moral imperfection. "Correction of all these evils is our responsibility as citizens, but the solution of health problems is our own special responsibility as medical citizens."

Expanding in detail on the objective of the American Medical Association, as reaffirmed by the House of Delegates in June

1944, namely "availability of medical care of a high quality to every person in the United States," Dr. Fitzgibbon added "I recognize that there will be a minority disagreement by those advocating complete socialization and government control of medicine and allied activities. Those who believe in compulsion have their arguments, which I am willing to listen to as a private practitioner and part time teacher. I cannot agree with them. I cannot agree that the private practitioner has been relegated to the position of distributor of medical service or that the full time salaried man is alone God's gift to humanity. No doubt much can be said on both sides, but further argument merely adds to the medical windstorm." The National Program for Physical Fitness, outlined by Col. Leonard G. Rowntree, will, he said, enable America, "which is predestined to play a major role in world leadership," to make her people physically, mentally and morally fit.

Accelerating the "production" of doctors by "getting boys and girls into college two years earlier by cutting out the overlapping between high school and college" was advocated by William Mather Lewis, president of Lafayette College, in an address which concluded the three day session. He criticized the "deferred maturity" of doctors at the age of 31 and expressed the belief that they could complete education much earlier "at least during the transition period" between war and peace.

Among the other speakers were Major Gen. Norman T. Kirk, Army Surgeon General; Vice Admiral Ross T. McIntyre, Navy Surgeon General; Major Gen. David N. W. Grant, Air Surgeon, and Commodore Arthur W. Clarke, D.S.O., Royal Navy, chief of staff to Admiral Sir Percy Noble of the British navy delegation to the United States.

MEDICAL ECONOMIC ABSTRACTS

OHIO MEDICAL CARE PLAN

The Academy of Medicine of Cincinnati has endorsed a plan by which a mutual insurance company in cooperation with the Blue Cross Plan of Ohio will undertake to provide surgical and obstetric service for members of the Blue Cross Plan.

In a statement which accompanies the issue of the Monthly News Letter of the Academy of Medicine for August 12 it is stated that the plan proposes to include the following benefits for subscribers:

1. The benefits to be paid the subscriber for surgical and obstetric care not to be lower than the highest provided by commercial insurance carriers nor lower than the scale of fees, where applicable, paid by the industrial commission to physicians.

2. Full coverage for dependent members of subscriber's family, which now is not available through commercial insurance carriers.

3. All types of surgical procedure covered and no exclusions except where such treatment is available without cost to the subscriber under existing laws.

4. No limitations except as follows:

- (a) Hospitalized illnesses only.
- (b) Waiting period of six months for tonsil and adenoid operations.
- (c) Membership waiting period of nine months for obstetric benefits.
- (d) Obstetric benefits available only on insured or insured's spouse.
- (e) Waiting period of one year for preexisting conditions.
- (f) Available only on group underwriting basis with requirement of 50 per cent enrolment of employees.
- (g) Fees must be paid by employer or collected by him on payroll deduction basis from employee.
- (h) \$150 limit for two or more operations within period of three months.

Payment is to be on the indemnity plan but sufficient to meet the usual charge made to wage earners. To organize such a mutual company a deposit of \$50,000 with the state insurance department is required, and another \$25,000 must be raised to pay the cost of the organization period.

UNITED MEDICAL SERVICE PLAN OF NEW YORK

According to a circular addressed "to the members of the Medical profession of Metropolitan New York in which the United Medical Service, Inc. will operate" this service is the result of a merger of Community Medical Care, Inc., and Medical Expense Fund of New York, Inc. It is the only company of this type in greater New York which has been approved by the Medical Society of the State of New York. The merger brings to the new organization approximately 6,500 members who have been subscribers to the previous organization.

The United Medical Service, Inc. "has adequate cash resources: its legal surplus as of July 1, 1944 was approximately \$144,000. It has medical contracts at present in force insuring over 56,000 persons." It is affiliated through the organization of the Associated Hospital Service, which now has 1,500,000 subscribers. Physicians' fees will be based on the workmen's compensation schedule, and in the beginning only a limited service contract covering obstetrics and surgical specialties in hospitals will be offered.

The income limits are to be determined by the board of directors and approved by the council of the Medical Society of the State of New York. It is proposed to issue comprehensive contracts for full medical service on an experimental basis limited in the beginning to not more than 25,000 subscribers.

Nathan B. Van Etten, M.D., is chairman of the board, and Rowland H. George president.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Personal.—Dr. Hubert S. Houston has resigned as tuberculosis physician at the Kilby Prison Hospital, Montgomery, to devote full time to his duties as resident physician at the Montgomery Tuberculosis Sanatorium.

Pediatric Meeting.—On September 26 the Alabama Pediatric Association held its eighteenth annual meeting in Birmingham. Among the speakers were:

Dr. Albert E. Casey, Birmingham, Human and Place Contacts and Radial Spread of Epidemic Poliomyelitis.
Dr. William Fred Mayes, Atlanta, Ga., The Premature Infant.
Dr. Ralph V. Platon, New Orleans, Kodachrome Clinic.
Dr. Roy R. Kracke, Birmingham, Diagnosis of Hemorrhagic Diseases in Children.
Dr. Hughes Kennedy Jr., Birmingham, The Rh Factor in Pediatrics.

New Medical School Receives Donation for Research.

—A check for \$25,000 has been given to the new University of Alabama Medical School for use exclusively in research work. The gift was made possible under the will of John R. Irby, owner of the Shelby Springs properties. Newspaper reports indicated that Mr. Irby directed that the net proceeds from the sale of Shelby Springs be turned over to some medical school, to be selected by the executor, for use in research into the cause and cure of arthritis, from which he had suffered for many years. Sidney W. Smyer, Birmingham attorney, as executor, selected the Alabama medical school for the gift.

CALIFORNIA

Changes in Licensure.—At a meeting of the California State Board of Medical Examiners in Los Angeles in August the licenses to practice medicine were restored to Drs. Pearl J. Anderson and Paul S. Traxler.

Medical Society Completes Fifty Years.—The Santa Barbara County Medical Society, which was organized July 4, 1894 with the late Dr. James B. Shaw as president, is planning a program to commemorate the event sometime this year, it is reported.

Symposium on Heart Disease.—The fifteenth annual postgraduate symposium on heart disease of the San Francisco Heart Committee will be held October 26-28. The first day's session will be at the University of California Medical School and the second at the Stanford University School of Medicine and San Francisco Hospital. The third day's program will be held in the auditorium of the nurses' home, Mount Zion Hospital. Dr. Francis L. Chamberlain is chairman of the San Francisco Heart Committee of the San Francisco Tuberculosis Association.

Institute in Health Education.—Clair E. Turner, Dr. P.H., health education consultant of the Office of the Coordinator of Inter-American Affairs, will conduct an institute in health education for professional workers, October 17-18. At the first education for physicians, dentists, nurses and others the discussion will be devoted to community efforts in education for health. The second meeting will deal with the balancing of learning by experience against learning by instruction, individual health education and the doctor's and dentist's place in health education. The institute is being sponsored by the San Francisco County Medical Society and the health education committee of the San Francisco Community Chest.

ILLINOIS

Personal.—Dr. Edward K. Steinkopff, Janesville, Wis., has been appointed superintendent of the Madison County Sanatorium, Edwardsville, effective November 1, succeeding Dr. Joseph T. Maher. Dr. Steinkopff recently resigned his position as chief of the state division of tuberculosis control to accept a position as medical director of the Pinehurst Sanatorium, Janesville (THE JOURNAL, July 22, p. 858).

Dr. Kronenberg Joins Caterpillar Tractor Company.—Dr. Milton H. Kronenberg, Chicago, chief of the division of industrial hygiene of the Illinois Department of Public Health, has been appointed assistant to the medical director at Cater-

pillar Tractor Company, Peoria, effective October 1. Dr. Harold A. Vonachen, Peoria, is medical director. Dr. Silvio M. Scalzo, a member of the staff at the company since 1942, has been promoted to chief plant physician. Dr. Herman M. Soloway, who has been serving as venereal disease control officer in the state division of industrial hygiene (THE JOURNAL, July 22, p. 858) will be acting chief until a successor to Dr. Kronenberg has been named.

Chicago

University News.—Dr. Malcolm T. MacEachern, associate director of the American College of Surgeons, lectured at the University of Chicago School of Medicine, September 27, under the auspices of the Nu chapter of Alpha Kappa Kappa. His subject was "Postgraduate Medical Education."

Affirm Jail Term for Dr. Fernel.—The circuit court of appeals on October 3 affirmed the sentence of one year in prison and a fine of \$500 given a year ago by Judge Philip L. Sullivan to Dr. Jean Paul Fernel (THE JOURNAL, Nov. 27, 1943, p. 849) for using the mails to defraud, newspapers report. It was also reported that Dr. Fernel has been in the county jail for the past several weeks because of inability to post a \$5,000 bond on new government fraud charges.

KANSAS

Thirty Years' Service on State Board Honored.—Dr. Harry L. Aldrich, Caney, was guest of honor at a luncheon given by the Kansas State Board of Health recently in recognition of his thirty years of service as a member of the board. A plaque was presented to Dr. Aldrich bearing the following inscription:

In recognition of thirty years of service as a member of the Kansas State Board of Health, and as a memento of his valuable contribution to the work of maintaining and promoting the public health of our great state of Kansas for nearly a third of a century, this plaque is dedicated by his colleagues.

Medical Education Fund.—To provide refresher courses and graduate training for physicians of the state, the executive council of the Kansas Medical Society has authorized the establishment of a fund to finance the work. A goal of \$100,000 has been set. The plan proposed a series of short, intensive courses to be offered by the University of Kansas School of Medicine, Lawrence-Kansas City, with classes starting early in 1945 and with the state medical society and the state board of health cooperating. The main purpose of the funds are to:

- Provide immediate assistance to returning Kansas physicians now in military service, through refresher courses covering all fields of medicine.
- Rehabilitate those wounded or suffering other service incapacities by training in specialties adapted to their disabilities.
- Provide a revolving medical scholarship for children of Kansas physicians losing their lives in service in the present war who have been accepted as students in any approved medical college.
- Provide a permanent program of postgraduate training in medicine and surgery for all Kansas physicians.

Postgraduate courses will be conducted on a circuit basis in forty-five or fifty centers of the state to supplement the short postgraduate courses that will continue to be given in various towns in the state. According to the *News Letter* of the Kansas State Board of Health the Kansas Medical Society formulated the plan especially in recognition of the sacrifices so willingly made by members now serving in the armed forces.

MARYLAND

Course in Industrial Medicine.—The John Hopkins School of Hygiene and Public Health will conduct a course in industrial health for eight weeks beginning October 17. The program will include a comprehensive range of industrial health phases.

MINNESOTA

Personal.—Dr. Walter Henry Judd, Minneapolis, representative in Congress from the fifth district of Minnesota, received the honorary degree of doctor of laws from Washington and Jefferson College, Washington, Pa., recently.

Pediatric Meeting.—The Northwest Pediatric Society held its fall meeting at the White Pine Inn, Bayport, September 29-30. The guest speaker was Dr. Arild E. Hansen, Galveston, who discussed "Problems of Lipid Metabolism in Pediatrics."

Dr. Rosenow Goes to California.—Dr. Edward C. Rosenow, who recently became emeritus professor of experimental bacteriology at the Mayo Foundation, University of Minnesota Graduate School, has accepted an invitation to join the

California Institute of Technology, Pasadena, to continue with his research. Dr. Rosenow graduated at Rush Medical College in 1902 and has been identified with the Mayo Clinic and University of Minnesota since 1915.

MISSISSIPPI

Changes in Health Personnel.—Dr. Barbara Hunt, Meridian, has been appointed health officer of Chickasaw County. Dr. Robert E. Rothermel has been appointed director of the Harrison County Health Department, succeeding Dr. Henry W. Kassel, who has been assigned to a position in Guatemala City, Guatemala. Dr. Robert H. Bostwick Jr. has resigned as health officer of Marshall and Union counties, New Albany; he will enter private practice in New Albany.

Dr. Underwood Honored.—The *Mississippi Doctor* for September has been designated the Underwood issue in honor of Dr. Felix J. Underwood, state health officer. Dr. Underwood is past president of the American Public Health Association. The journal carries many tributes for Dr. Underwood and a review of the health of the state under his direction. Among contributors are Thomas Parran, Surgeon General of the U. S. Public Health Service, Dr. John A. Ferrell, medical director of the John and Mary R. Markle Foundation, New York, and Dr. Waller S. Leathers, dean of the Vanderbilt University School of Medicine, Nashville, Tenn., and the immediate predecessor in Mississippi of Dr. Underwood.

MISSOURI

New Director of Child Hygiene.—Dr. Lynn M. Garner, formerly health officer of district number 8 with headquarters at Higginsville, has been appointed director of the division of child hygiene for the state board of health, Jefferson City. Dr. Garner graduated at St. Louis University School of Medicine in 1930.

Medical Committee for Vocational Education.—Dr. Robert Elman, St. Louis, has been appointed chairman of a committee which was recently appointed to work with the state board of vocational education in extending the state's rehabilitation program. The program, which was made possible by legislation in 1943, aims to assist the indigent disabled to full or increased earning capacity. Other members of the committee include Drs. Frank R. Bradley, J. Arthur O'Reilly, James B. Costen, Edwin F. Gildea, St. Louis; B. Landis Elliott, Frank D. Dickson, Herbert L. Mantz, A. Graham Asher, Kansas City; Arthur R. McComas, Sturgeon; William A. Bloom, Fayette; C. B. Souter Smith, Springfield; Dudley S. Conley, Columbia, and John W. Williams Jr., Jefferson City.

Health Plan Soon in Operation.—With the granting of a pro forma decree of incorporation to Missouri Medical Service, plans are near completion to start the state's prepayment medical and surgical care plan approved this year by the Missouri State Medical Association (*THE JOURNAL*, July 22, p. 859). The October state medical journal expected the plan to be in operation within six weeks. The plan will be administered through Blue Cross Service under authorization of the board of trustees of Missouri Medical Service, which will guide policies. It provides for medical and surgical care for hospitalized cases at a cost to single persons of 85 cents per month and to families, regardless of their size, of \$2.25 per month. Although subscribers must join in groups, professional or trade association, labor unions or others, the plan is open to every one. For the present, families will be limited to \$1,000 of medical and surgical care in one year.

NEBRASKA

Mid-West Clinical Society.—The twelfth annual session of the Omaha Mid-West Clinical Society will be held at the Hotel Paxton, Omaha, October 23-27, under the presidency of Dr. James F. Kelly, Omaha. Among the speakers will be:

- Dr. Leroy Sauter, St. Louis, Correlation of the Roentgenologic and Pathologic Findings in Acute Pneumonic Processes.
- Dr. Thomas P. Findley Jr., New Orleans, The Symptomatology of Chronic Amebiasis and Shigellosis.
- Dr. Clarence Guy Lane, Boston, The Cutaneous Disturbances Caused by Therapeutic Measures.
- Lieut. Col. James Barrett Brown, M. C., Compound Facial Injuries.
- Major Albert B. Sahin, M. C., Natural History of Human Poliomyelitis.
- Dr. Edward H. Runcerson, Rochester, Minn., Real versus Supposed Disturbances of the Endocrine Glands.
- Dr. Clifford B. Lull, Philadelphia, Diet in Pregnancy.
- Dr. Paul H. Holmker, Chicago, Post-Thyroidectomy Bilateral Laryngeal Paralysis: Medical and Surgical Aspects.
- Dr. Alton R. Kilgore, San Francisco, The Changing Picture of Breast Cancer.

Dr. Nolan D. C. Lewis, New York, Psychosomatic Medicine.
Dr. Carl E. Badgley, Ann Arbor, Mich., Pain in the Upper Extremity. Differential Diagnosis and Treatment.
Dr. Malcolm T. MacEachern, Chicago, The American College of Surgeons' Program for the Expansion of Graduate Training in Surgery.
Edward R. Loveland, executive secretary, American College of Physicians, Philadelphia (subject not announced).

There will be symposiums on "Place of X-Ray and Radioactive Substances in the Treatment of Disease," "Acute Upper Respiratory Infections" and "Diabetes." In addition a series of lecture courses and round table discussions will be held during the meeting covering a wide range of subjects. The program will also include a number of clinics. Thursday evening has been designated the Omaha Douglas County Medical Society Night with the following speakers: Dr. Badgley on "Present Day Concept of the Treatment of Acute Hematogenous Osteomyelitis" and Dr. Lewis, "Recent Trends in Neuropsychiatric Thinking and Practice." Friday morning will be devoted to a discussion of military medicine with the following speakers:

- Lieut. Col. Vernon L. Hart, M. C., A Study of One Hundred Fractured Legs.
- Col. John B. Grow, M. C., Bronchiectasis, Its Surgical Treatment.
- Major Frank P. Foster, M. C., Rheumatic Fever Clinical Findings, Comment on Diagnostic and Therapeutic Features from 350 Cases.
- Major Charles R. McAdam, M. C., Meningococcal Infections.
- Lieut. Col. Frank B. Queen, M. C., Clinical Uses of Penicillin, with Reasons for Therapeutic Failures.

NEW YORK

Personal.—Dr. Charles R. Seymour, Binghamton, was given a citation for distinguished service by the Alumni Association of Albany Medical College, September 16. Dr. Seymour graduated at Albany in 1892 and has served twice as president of the Broome County Medical Society. Dr. Walter W. Wicks, Pine Plains, was recently appointed township health officer, succeeding the late Dr. Ellwood Oliver.

Rest Center for Merchant Seamen.—The seventh rest center in the United States to care for the merchant seamen was dedicated September 28 when the 72 acre estate of the late Mrs. Christian R. Holmes, the Chimneys, Sands Point, L. I., was turned over to the United Seamen's Service and the War Shipping Administration, which will jointly operate the place for the benefit of seamen who suffer from convoy fatigue or enemy action, according to the *New York Times*. Dr. Daniel Blain, New York, is medical director. The dedication also marked the second anniversary of the USS-WSA medical division. Among the speakers at the dedication was Ralph C. Williams, assistant surgeon general of the U. S. Public Health Service.

New York City

Harvey Lecture.—E. Newton Harvey, Ph.D., Henry Fairfield Osborn professor of physiology, Princeton University, N. J., will deliver the first Harvey Society Lecture October 26 on "Decompression Sickness and Bubble Formation in Blood and Tissues." The lecture is one of a series given annually by the Harvey Society in affiliation with the New York Academy of Medicine.

Friday Afternoon Lectures.—On November 3 the regular Friday afternoon lectures of the New York Academy of Medicine will open for the current season with a talk by Dr. James A. Shannon on "Recent Advances in Drug Therapy." The lectures for the remainder of 1944 include:

- Lieut. Col. Theodore C. Thompson, M. C., War Fractures, November 10.
- Dr. Joseph Harkavy, Newer Concepts of Bronchial Asthma and Treatment, November 17.
- Dr. Frank L. Meleney, The Problem of Infection in Burns, December 1.
- Dr. Emanuel Libman, Diagnostic Observations on Abdominal Diseases, December 8.
- Dr. Arthur M. Fishberg, The Surgical Treatment and Course of Essential Hypertension, December 15.

Suiter Lectureship Created.—Dr. Stuart Mudd, professor of bacteriology, University of Pennsylvania School of Medicine, Philadelphia, will deliver the newly created A. Walter Suiter Lecture, November 2, on "Air Borne Infection: The Rationale and Means of Disinfection of Air." The lecture was created under the will of the late Dr. A. Walter Suiter, Herkimer, N. Y., and will be conducted annually under the auspices of the committee on public health relations of the New York Academy of Medicine. Dr. Suiter, who graduated at the Medical Department of Columbia College, New York, in 1871, died May 28, 1925, aged 75. He served for a long time as coroner of Herkimer County and as medical examiner for a number of insurance groups. He aided in the establishment of the state board of medical examiners. He was vice president of the state medical society in 1888, president in 1891, held at various times other positions of importance and was considered a pioneer in the development of legal medicine.

PENNSYLVANIA

Society News.—Dr. Lewis R. Wolf, Philadelphia, discussed the "Surgical Treatment of Strabismus" before the Reading Eye, Ear, Nose and Throat Society in Reading, September 20.

—Dr. Ross K. Childerhose, Harrisburg, was elected president of the Pennsylvania chapter of the American College of Chest Physicians at its recent annual meeting in Pittsburgh.

Dr. Chevalier L. Jackson, Philadelphia, is vice president and Dr. Edward Lebovitz, Pittsburgh, secretary-treasurer.—Dr. Charles H. Mann Jr., New York, discussed "Recent Developments in Diagnosis and Control of Venereal Disease" before the Harrisburg Academy of Medicine, September 19.

Philadelphia

Dr. Bertolet Named Coroner.—Dr. J. Allan Bertolet has been appointed coroner of Philadelphia to succeed the late Dr. Herbert M. Goddard. Dr. Bertolet graduated at the Jefferson Medical College of Philadelphia in 1916.

University News.—Among the speakers at the annual alumni dinner of the Jefferson Medical College of Philadelphia September 21 were Dr. William H. Perkins, dean of the medical college, who graduated in 1917, Major Gen. George F. Lull, M. C., class of 1909, and Dr. John Lincoln Bower, class of 1888, who represented the "old guard." Sixteen members of this year's graduating class received commissions as lieutenant (jg) medical corps, U. S. Naval Reserve, 109 members temporary commissions as first lieutenant, medical corps, Army of the United States, and two members commissions as first lieutenant, Army Medical Reserve Corps. Franklyn B. Snyder, LL.D., president of Northwestern University, Evanston, Ill., gave the 120th annual commencement address September 22 on "An Incident in the History of Fort Ticonderoga." The September graduating class recently presented to the college a portrait of Dr. Charles E. G. Shannon, professor of ophthalmology since 1927.

Graduate Medical School to Include Dentistry.—The Graduate School of Medicine of the University of Pennsylvania, organized in 1916 to provide for graduate studies in clinical medicine, will in the future extend its activities to include graduate studies in dentistry. The new work will be under the direction of John W. Ross, D.D.S., who has been appointed vice dean for dentistry in the graduate school of medicine and who will work in cooperation with the vice deans for other medical studies under Dr. Robin C. Buerki, dean of the Graduate School of Medicine. In connection with the new graduate program in dentistry, courses are being planned for graduate studies in oral surgery, orthodontics, prosthetics and oral medicine-periodontics. The first period of study for those students entering the graduate program will be devoted to basic studies involving the medical sciences as applied to the clinical specialties concerned, together with the principles and practice of that specialty and its relation to other clinical specialties. The studies of this period will lead to a certificate. The second period of study will be under preceptors, and this period must be preceded by the basic studies at the university. The studies under the preceptors may be carried on at any approved institution, and academic credit will be granted for time by the university, provided the specific plan for such studies for each candidate receives due approval and acceptance by the university. The successful completion of the period of study carried on under the preceptors will lead to the degree of master of science in dentistry. The program in dentistry in the Graduate School of Medicine will be independent of the School of Dentistry at the university. Dr. Ross graduated at the School of Dentistry at the University of Pennsylvania in 1917.

RHODE ISLAND

Medical Convocation.—Brown University, Providence, sponsored a medical convocation recently with Dr. Charles A. McDonald, chairman of the newly created department of medical sciences, presiding. James P. Adams, LL.D., vice president of the university, opened the meeting with a talk on "Department of Medical Sciences in Brown University," to which Dr. Elihu S. Wing, Providence, president of the Rhode Island Medical Society, responded. The convocation address was delivered by Dr. Henry R. Viets, librarian of the Boston Medical Library, on "Medical Education—Old Purposes and New Methods." The new department was announced in THE JOURNAL, July 22, page 861.

State Journal Honors Hospital on Centennial.—The Rhode Island Medical Journal for August was designated the Butler Hospital Centennial Issue. The journal carried historical material on the hospital reviewing its progress in the last hundred years. The hospital was created with a bequest of \$30,000 left by Nicholas Brown in 1841 "toward the erection or endowment of a . . . retreat for the insane." After the original charter was granted to establish the Rhode Island Asylum for the Insane the Hon. Cyrus Butler gave \$40,000 toward the institution, provided a contingent gift could be subscribed. In November 1844 the institution was named the Butler Hospital for the Insane. Butler Hospital was not only the first mental hospital but the first hospital in Rhode Island.

TEXAS

Change in Health Officers.—Dr. William P. Scarlett, director of the division of venereal diseases in the Corpus Christi Health Department, has been appointed in charge of the Wichita County Health Unit, succeeding Dr. David F. Bradley, who has been appointed medical officer in charge of the state quarantine hospital, Corpus Christi.

State University Considers Move.—In a recent report to the board of regents of the University of Texas, Homer P. Rainey, LL.D., president of the university, made the recommendation that the medical branch be moved from Galveston to Austin to be merged with the main university. The recommendation has evoked considerable discussion in newspapers and other sources but no definite action has been taken.

New Experimental Society.—Dr. James A. Greene, Houston, was recently elected chairman of the newly organized Southwest Section for the Society of Experimental Biology and Medicine and Dr. Donald H. Slaughter, Dallas, was elected secretary. Meetings of the new group will be held three times a year in rotation at Southwestern Medical College, Dallas, Baylor University College of Medicine, Houston, University of Texas, Austin, and occasionally at the University of Oklahoma School of Medicine, Oklahoma City.

Dallas Clinical Conference.—The Dallas Southern Clinical Society will hold its fifteenth annual spring clinical conference at the Hotel Adolphus, Dallas, March 19-22, with the following speakers:

Dr. J. Arnold Bagen, Rochester, Minn., gastroenterology.
Dr. Charles A. Doan, Columbus, Ohio, internal medicine.
Dr. Samuel C. Harvey, New Haven, Conn., surgery.
Dr. Charles B. Huggins, Chicago, urology.
Dr. Ira H. Lockwood, Kansas City, Mo., radiology.
Dr. Donovan J. McCune, New York, pediatrics.
Dr. Joe V. Meigs, Boston, gynecology.
Dr. Leroy A. Schall, Boston, otolaryngology.
Dr. William H. Sebrell Jr., Bethesda, Md., basic science.
Dr. Edmund B. Spaeth, Philadelphia, ophthalmology.
Dr. Richard H. Sweet, Boston, surgery.
Dr. George W. Thorn, Boston, internal medicine.

VIRGINIA

Dr. Wampler Goes to Baltimore.—Dr. Frederick J. Wampler has resigned as professor of preventive and industrial medicine at the Medical College of Virginia, Richmond, to become medical director of the Rustless Iron and Steel Corporation, Baltimore, effective October 1.

Change in Health Personnel.—Dr. Peyton M. Chichester, assistant director of local health services with headquarters in Richmond, of the state health department, has been named to a similar position at Abingdon to succeed Dr. Harold M. Kelso, who has accepted a position with the Knoxville, Tenn., Health Department.

Hospital News.—Dr. John A. Shackelford, owner and operator of Shackelford Hospital, Martinsville, which was opened more than twenty years ago by his father, the late Dr. Jesse M. Shackelford, announces that the institution will be closed on the opening of the new Martinsville General Hospital. A federal grant and loan totaling \$602,000 has been made to the new project, according to *Southern Medicine and Surgery*. The 54 bed hospital is located in the downtown section of the city. When closed, all operational equipment will be moved to the new hospital and the building will be converted into business property.

WASHINGTON

State Medical Election.—Dr. George H. Anderson, Spokane, was chosen president-elect of the Washington State Medical Association at its annual meeting in Seattle, September 9-10, and Dr. Raymond L. Zech, Seattle, was inducted into the presidency. Dr. Ross D. Wright, Tacoma, was named vice president.

GENERAL

Meeting on Clinical Research.—The seventeenth annual meeting of the Central Society for Clinical Research will be held at the Drake Hotel, Chicago, November 3-4. Dr. Carl V. Moore, Washington University School of Medicine, St. Louis 10, is the secretary.

Director of Technical Education Named to Infantile Paralysis Foundation.—Miss Catherine A. Worthingham has been granted a leave of absence from Stanford University, Calif., where for the past seven years she has been director of physical therapy in the school of health (women), to become director of technical education for the National Foundation for Infantile Paralysis. Miss Worthingham will act in a liaison capacity between the National Foundation and the treatment centers throughout the United States where training courses in occupational therapy are being sponsored by the foundation.

Special Society Elections.—At the annual meeting of the Radiological Society of North America in Chicago in September Dr. Lowell S. Goin, Los Angeles, was chosen president-elect and Dr. Lewis G. Allen, Kansas City, Kan., was installed as president. Other officers are Drs. Sydney J. Hawley, Danville, Pa., Robert R. Newell, San Francisco, and John S. Bouslog, Denver, vice presidents. Dr. Donald S. Childs, Syracuse, N. Y., was reelected secretary-treasurer.—Dr. Ross Golden, New York, was named president-elect of the American Roentgen Ray Society at its recent annual meeting in Chicago and Dr. Lyell C. Kinney, San Diego, was inducted into the presidency. Other officers include Dr. Raymond C. Beeler, Indianapolis, and Comdr. Harold W. Jacox (MC) vice presidents; Dr. H. Dabney Kerr, Iowa City, secretary, and Dr. James B. Edwards, Leonia, N. J., treasurer.—Dr. Milton J. Rosenau, Chapel Hill, N. C., was chosen president-elect of the American Public Health Association at its annual meeting in New York, October 4, and Dr. John J. Sippy, Stockton, Calif., was inducted into the presidency. Vice presidents are Dr. Malcolm R. Bow, Edmonton, Canada; Carlos E. Paz-Soldan, Lima, Peru, and Marion W. Sheahan, R.N., Albany, N. Y. Dr. Reginald M. Atwater, New York, is the executive secretary and Louis I. Dublin, Ph.D., New York, was reelected treasurer.

Meeting of Urologists.—The nineteenth annual meeting of the North Central Section of the American Urological Association will be held at the Stevens Hotel, Chicago, October 19-21, under the presidency of Dr. Harry W. Plaggenmeyer, Detroit. Among the speakers will be:

- Dr. Austin I. Dodson, Richmond, Va., Renal Pathology Resulting from Nephropoiesis.
- Dr. Edward J. Stieglitz, Washington, D. C., Significance of Senescence.
- Lieut. Col. Walter M. Kearns, M.C., Postcaval Ureter; Preoperative Diagnosis; Resection and Successful Anastomosis.
- Harry J. Anson, Ph.D., Chicago, Blood Supply of the Kidneys, Suprarenal Glands and Associate Structures.
- Drs. Edward N. Cook and Francis R. Keating Jr., Rochester, Minn., Renal Stone Associated with Hyperparathyroidism.
- Drs. Robert W. McAllister and Vincent J. O'Connor, Chicago, Effect of Penicillin on Carbuncle of Kidney.
- Drs. Robert H. Herbst and James W. Merricks, Chicago, Staphylococcus Albus Septicemia Following Nephrolithotomy: Recovery with Penicillin.
- Drs. Budd C. Corbus and Budd C. Corbus Jr., Evanston, Ill., Endocrine Management of Prostatic Cancer.
- Comdr. Gershon J. Thompson (MC) and Dr. Laurence F. Greene, Rochester, Transurethral Prostatic Resection in Patients with Advanced Renal Insufficiency.
- Drs. Reed M. Nesbit and Edgar A. Wehl, Ann Arbor, Mich., The Use of Scrotal Skin for Covering the Denuded Penis.
- Dr. Charles C. Higgins, Cleveland, Transplantation of the Ureters into the Rectosigmoid in Infants.
- Dr. Daniel C. Moore, Chicago, The Use of Intravenous Alcohol in Surgical Patients.
- Dr. William J. McMartin, Omaha, Urological Aspects of Filariasis.
- Comdr. Robert A. Buhlans (MC), Observations on Filariasis in U. S. Naval Medical Service.
- Dr. George H. Exell, Madison, Wis., An Acute Exacerbation of Brucellosis Complicating Urological Surgery.
- Major Frank C. Hamm, M.C., Renal Polyp of the Upper Calix Treated by Heminephrectomy.
- Dr. Mary Karp, Chicago, Anesthesia for the Urological Patient.

At a joint meeting with the Chicago Urological Society, Thursday evening, William C. Rose, Ph.D., Urbana, Ill., will deliver the sixteenth annual William T. Belfield Memorial Lecture on "The Amino Acid Requirements of Man."

Board of Obstetrics and Gynecology.—The American Board of Obstetrics and Gynecology will conduct its next written examination and review of case histories part I for all candidates in various cities of the United States and Canada on Saturday, Feb. 3, 1945 at 2 p. m. Candidates who successfully complete the part I examination proceed automatically to the part II examination held later in the year. All applications must be in the office of the secretary by Novem-

ber 15. All candidates are now required to be out of medical school not less than eight years, and in that time they must have completed an approved one year internship and at least three years of approved special formal training, or its equivalent, in the seven years following the intern year. The board's requirements for internships and special training are similar to those of the American Medical Association, since the board and the Association are at present cooperating in a survey of acceptable institutions. Beginning with the next written examination, which is scheduled to be held Feb. 3, 1945, the board will limit the written examination to a maximum period of three hours, and in submitting case records at this time all obstetric reports which do not include measurements either by calipers and, as indicated, by acceptable x-ray pelvimetry will be considered incomplete. All candidates are required to take the part I examination, which consists of a written examination and the submission of 25 case history abstracts, and the part II examination, which consists of an oral-clinical and pathology examination. The part I examination will be arranged so that the candidate may take it at or near his place of residence, while the part II examination will be held late in May 1945 or early June 1945 in the city nearest to the largest group of candidates.

CANADA

University News.—Group Captain George E. Hall, director of medical research for the Royal Canadian Air Force, has recently been appointed dean of the University of Western Ontario Medical School, London.—Dr. Fraser B. Gurd has been named chairman of the department of surgery at McGill University Faculty of Medicine, Montreal, succeeding Dr. Frank E. McKenty.

Special Fellowships for Chinese.—Dr. Yang Gia-liang, associate professor of surgery, West China Union University, Chengtu, has been awarded the first fellowship under a recently inaugurated program of postgraduate training for Chinese physicians at McGill University Faculty of Medicine, Montreal. The fellowships will be known as the McGill-Chinese Medical Fellowships. "In token of appreciation of the heroism of the people of China, and particularly of the magnificent work done during the past ten years of the medical profession in that country, the board of governors of McGill University has decided to award a small number of McGill-Chinese Medical Fellowships to outstanding physicians and surgeons from China." Each person awarded a fellowship will receive a senior's intern appointment at one of the teaching hospitals of the city. It was announced that because of the circumstances of the war the Chinese government will not be in a position to grant permission for many Chinese physicians to accept this offer.

LATIN AMERICA

Health Activities in Latin America.—*Institute for Hospital Administrators.*—The Inter-American Hospital Association will sponsor the second regional institute for hospital administrators in Lima, Peru, December 3-16. The director of the institute will be Dr. Guillermo Almenara, director of the Hospital Obrero, Lima, and the secretary will be Felix Lamela, Washington, D. C., executive director, Inter-American Hospital Association, Washington. The program will cover all phases of hospital operation and the faculty includes forty-eight authorities in hospital and related fields from Mexico, Central America, South America and the United States. Eleven educational institutions of Peru and eight professional and government organizations of the United States are participating in the institute, which will be held under the auspices of the Pan American Sanitary Bureau. Dr. Gustavo Baz, minister of public health and assistance of Mexico, is president of the institute and Drs. Malcolm T. MacEachern, Chicago, and Hugh S. Cumming, Washington, honorary presidents.

Society News.—The first congress on pediatrics is planned for Santiago, Chile, late in November under the auspices of the Sociedad Chilena de Pediatria.

CORRECTION

Thiourea and Thiouracil.—The word "collection" should have appeared in place of "correlation" on the sixth line from the bottom, first column, in the editorial on page 173 of THE JOURNAL September 16. The word "no" should have been inserted between the words "thiouracil" and "new" on the same page, second column, fifth line from the top.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept 9, 1944

British Empire Casualties in Five Years of War

Casualties to all ranks of the British Empire forces during the first five years of the war now amount to 925,963, which include 242,995 killed, including died of wounds, 80,603 missing, 311,500 wounded and 290,865 prisoners of war and internees. Civilian air raid casualties, casualties to merchant seamen and deaths from natural causes are excluded, together with missing personnel who subsequently rejoined, and repatriated prisoners of war.

The casualties of merchant seamen in British ships during the five years were 29,381 deaths (including deaths presumed in missing ships) and 4,192 internees. These include nationals of the dominions, India and the colonies serving in British registered ships but do not include losses in ships registered outside the United Kingdom.

Civilian air raid casualties in the United Kingdom for the five years were 56,195 killed (or missing, believed killed) and 75,897 injured and detained in hospitals.

The complete total of casualties for the fighting forces, merchant seamen and civilians is 1,091,628. These figures compare favorably with those of the four and one-quarter years of the first world war. The total casualties for the British Empire forces were 3,490,907, of which 1,089,919 were killed and 2,400,988 wounded.

The Training of the War Blinded at St. Dunstan's

The great work done by St. Dunstan's in training men blinded in the war of 1914-1918 for various occupations has been described in previous letters to THE JOURNAL, as has also the treatment of British and allied men blinded in this war. In the annual report just published, the founder, Sir Ian Fraser, M.P., reports that he has recently talked in St. Dunstan's Hospital to men who had returned from the battles in France. A few will recover useful sight, but the majority will be blind for the rest of their lives. They will shortly go to St. Dunstan's training center to "learn to be blind." Three thousand veterans of the last war and several hundred of this war have already passed through the training center. They include many Canadians and Americans as well as representatives of all our dominions and most of our allies, and men and women from most of our home defense and air raid services. The majority of the older veterans and already many of the newcomers have learned to lead normal lives and to earn their living. St. Dunstan's continues to look after blinded veterans of the last war, who are now of middle age or even old age. Nearly 1,800 still survive. St. Dunstan's in Great Britain has never been without a bed or a training place for any new patient. St. Dunstan's throughout the empire is now developing rapidly to meet the inevitable casualties which will arise from the widespread engagement of our armed forces.

Penicillin for Civilians

The use of penicillin has been almost confined to the fighting forces, as the government regarded their needs as paramount. With increased production it has been possible to allot a limited supply for civilian use. So that it may be used to the best advantage, the Ministry of Health invited the faculties of medicine and schools of universities to be responsible for its use and distribution. The ministry has issued the following list of diseases for which penicillin may be used: 1. Conditions which call for admission to a hospital if the case is otherwise suitable for treatment with penicillin: staphylococcal infection, sep-

ticemia, early acute osteomyelitis, severe carbuncle, cavernous sinus thrombosis or any other life endangering infection, hemolytic, streptococcal, pneumococcal and meningococcal infections, any life endangering infection (septicemia, pneumonia, meningitis) which has failed to respond to adequate sulfonamide treatment. Gas gangrene.

2. Conditions deserving special consideration which may be treated if supplies are sufficient: (a) injuries of the eye and infections of the conjunctiva and cornea, (b) sepsis in wounds and burns, (c) infections of the skin resistant to other treatment (syphilis, impetigo), (d) sulfonamide resisting gonorrhea, (e) acute empyema and pyogenic infections of the pleura as a complication of tuberculosis, (f) traumatic lesions, including compound fractures, extensive muscle injuries, facial injuries, injuries necessitating suture of tendon or nerve, thoracic injuries (hemothorax) and post-traumatic pneumonias.

3. Conditions not to be treated are those caused by organisms not known to be susceptible to penicillin. These include rheumatic fever, ulcerative colitis and all other intestinal infections. Bacterial endocarditis and syphilis are also excluded.

A Professor of Child Health

The council of Liverpool University has created a post which is new in this country, "professor of child health," to which it has appointed a pediatrician, Dr. Norman B. Capon, who will be part time director of a new department of child health. The establishment of the new department has been made possible by the collaboration of the university with the city council and the Royal Liverpool Children's Hospital. The cost will be shared by all three bodies. The new department will be formally opened by the minister of health in the autumn. Its establishment is a logical extension within the faculty of medicine of the university and gives practical expression to the importance of child health in the welfare of the nation. The department will be concerned not only with investigation of the diseases of children but also with the preservation of good health, physical and mental, during the early years of life. It is in such great urban centers as Liverpool that problems of child health are most pressing, while opportunities for its study and promotion are most plentiful. The new title "professor of child health" is noteworthy. Only a short time ago the title would have been "professor of children's diseases", but, as in the case of the proposed "National Health Service," we want to emphasize that health is the goal and disease a thing to be prevented.

The Representative Meeting of the British Medical Association

The annual meeting of the British Medical Association did not take place in consequence of the war. The annual representative meeting was to have been held in London in July but was postponed for the same reason. Now it is announced that the representative meeting will be held on December 5. It is of great importance this year because its main business will be to determine the policy of the association in regard to the government's proposals for a comprehensive medical service.

Marriages

DONALD G. MASON, Menominee, Mich., to Miss Catherine Ryan of North Miami, Fla., in Ann Arbor, Mich., June 16.

BONNIE CLAYDE HALLEY JR., Temple, Texas, to Miss Joy Smith of Dallas in San Francisco, July 14.

THOMAS M. SPROCH, Latrobe, Pa., to Miss Joyce L. Rose of Allentown in Pittsburgh, August 19.

WILLIAM A. SAUTTER, Jackson, Mich., to Miss Marcelaine Joanne Chevre of Leslie, August 1.

ARTHUR GERARD MACK, Troy, N. Y., to Dr. JANE ANDREWS of Albany, August 19.

Deaths

Michael Hoke • Beaufort, S. C.; University of Virginia Department of Medicine, Charlottesville, 1895; member of the House of Delegates of the American Medical Association in 1908; member of the Medical Association of Georgia and the American Academy of Orthopaedic Surgeons; member and past president of the American Orthopaedic Association; honorary member of the Fulton County (Ga.) Medical Society; at one time clinical professor of orthopedic surgery at the Atlanta College of Physicians and Surgeons; appointed surgeon-in-chief of the Georgia Warm Springs Foundation, Warm Springs, Ga., in 1931 and resigned in 1936; for many years on the staff of the Scottish Rite Hospital for Crippled Children, Decatur, Ga.; served as orthopedic surgeon to the Piedmont Hospital, Presbyterian Hospital, Wesley Memorial Hospital and the Tabernacle Infirmary, Atlanta; conferred the honorary degree of doctor of laws by the University of North Carolina in 1931; died September 24, aged 70.

William Jerome Arlitz • Hoboken, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1890; Baltimore Medical College, 1897; fellow of the American College of Surgeons; for many years police surgeon; served during World War I; member of the staffs of the Christ Hospital, Jersey City, New Jersey State Hospital, Greystone Park, North Hudson Hospital, Weehawken, and the Moses Taylor Hospital, Scranton, Pa.; formerly on the staff of St. Mary's Hospital; served as chief surgeon of the Lackawanna Railroad and Public Service Corporation of New Jersey and the New York Central and Lehigh Valley railroads; died in Elizabethtown, N. Y., August 22, aged 75.

Grover Cleveland Weil • Pittsburgh; University of Pittsburgh School of Medicine, 1910; associate professor of surgery at his alma mater; specialist certified by the American Board of Surgery; member of the American Society of Clinical Pathologists, American Association for the Surgery of Trauma, American Association of Railway Surgeons and the American Association of Pathologists and Bacteriologists; fellow of the American College of Surgeons; on the staff of the Mercy Hospital; chief surgeon for the Pittsburgh Coal Company; died in Lake Placid, N. Y., August 17, aged 59, of coronary heart disease.

Enoch Marvin Mason • Birmingham, Ala.; Johns Hopkins University School of Medicine, Baltimore, 1906; past president of the Jefferson County Medical Society; member of the Southern Medical Association; served as councilor of the Ninth District of the Medical Association of the State of Alabama; specialist certified by the American Board of Internal Medicine; veteran of the Spanish-American War and World War I; at one time director of laboratories of the state board of health at Montgomery; visiting physician on the staff of St. Vincent's Hospital; medical director of the Alabama Power Company; died August 14, aged 66.

Hugh Loyd Davison • Champaign, Ill.; University of Pennsylvania School of Medicine, Philadelphia, 1924; fellow of the American College of Surgeons; member of the John B. Deaver Surgical Society; formerly physician for the Pennsylvania Railroad Company; at one time fellow in surgery at the Mayo Foundation in Rochester, Minn.; served during World War I; on the staffs of the Champaign County and Carle Memorial hospitals in Urbana, serving as chief of staff and director of the latter; a founder of the Carle Hospital Clinic; died in Benton Harbor, Mich., August 24, aged 47, of coronary occlusion.

David A. Holland, Mahanoy City, Pa.; Medico-Chirurgical College of Philadelphia, 1903; member of the Medical Society of the State of Pennsylvania; formerly served as a member and president of the city school board; school director for twenty years; a member of the board of directors of the Schuylkill County Crippled Children's Society and of the Union National Bank; surgeon for the Reading Coal and Iron Company and for the Reading and Lehigh Valley railroads; on the staff of the Locust Mountain State Hospital, Shenandoah; died July 16, aged 63, of chronic osteomyelitis of the right leg.

John Elmer Virden • New York; Bellevue Hospital Medical College, New York, 1890; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; specialist certified by the American Board of Ophthalmology; formerly associate professor of clinical ophthalmology at the New York Post-Graduate Medical School and Hospital, Columbia University; visiting ophthalmologist,

Union Hospital; consulting ophthalmologist, Westchester Square and Lincoln hospitals, Bronx Eye and Ear Infirmary, and Home for Incurables; died August 30, aged 81.

Samuel Treat Armstrong • Katonah, N. Y.; St. Louis Medical College, 1879; member of the American Psychiatric Association, Association for Research in Nervous and Mental Diseases, American Association for the Advancement of Science and the New York Academy of Sciences; from 1881 to 1890 had been with the U. S. Marine Hospital Service; veteran of the Spanish-American War; received the Companion Military Order of Foreign Wars and the Order of the Spanish-American War; medical director of the Hillbourne Farms, where he died August 31, aged 84, of cerebral thrombosis.

Spencer Lyman Dawes, Kingston, N. Y.; Bellevue Hospital Medical College, New York, 1887; formerly adjunct professor of materia medica at the Albany Medical College; medical examiner in the state department of mental hygiene from 1919 to 1935; secretary and executive officer of the Commission on Federal Legislation for Alien Insane when it was created by the state legislature in 1914; served as medical examiner for the State Bureau of Deportation; formerly consulting physician of Kingston City Hospital; died in the Orthmann Sanitarium, July 13, aged 80, of cerebral hemorrhage.

Frederick Henry Dillingham • New York; College of Physicians and Surgeons, New York, 1880; professor of dermatology and syphilology at the New York Polyclinic Medical School and Hospital; fellow of the New York Academy of Medicine; for many years assistant sanitary inspector for the New York City Board of Health; consulting dermatologist to St. Francis and St. John's Riverside hospitals and dermatologist to St. Joseph's Hospital in Yonkers; died in the New York Polyclinic Hospital August 30, aged 87, of bronchopneumonia.

Edward Holden Blair • Wethersfield, Conn.; College of Physicians and Surgeons, Baltimore, 1906; member of the American Academy of Pediatrics and the New England Pediatric Society; served in the medical corps of the U. S. Army during World War I; consultant on the staff of Hartford Hospital; school physician; died in Hartford August 14, aged 65, of coronary thrombosis.

Carrie Simpson Coleman Burr, Ann Arbor, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1898; died in the University Hospital July 1, aged 76, of gastric carcinoma.

Martha Nancy Canfield, Redlands, Calif.; Woman's Medical College of Pennsylvania, Philadelphia, 1908; formerly on the staff of the Battle Creek Sanitarium, Battle Creek, Mich.; served as resident physician at the Loma Linda Sanitarium and Hospital, Loma Linda; died July 28, aged 77, of hypertensive cardiovascular disease.

Wellman Franklin Chaffin, Raymore, Mo.; State University of Iowa College of Medicine, Iowa City, 1890; member of the Missouri State Medical Association; served during World War I; past president and secretary of the Cass County Medical Society; died July 30, aged 77, of cerebral hemorrhage.

George A. Clement, Spencer, N. C.; Leonard Medical School, Raleigh, 1905; died June 29, aged 73, of cerebral hemorrhage.

Mark A. Conway, Locust Gap, Pa.; Temple University School of Medicine, Philadelphia, 1917; member of the Medical Society of the State of Pennsylvania; died July 31, aged 49, of coronary thrombosis.

J. Demorest Curtis, Detroit; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; member of the auxiliary staff, Providence Hospital; died at Houghton Lake, Mich., August 29, aged 59, of coronary heart disease.

Joseph Elbert Daniel • Houston, Texas; Memphis (Tenn.) Hospital Medical College, 1901; for many years medical director of the Great Southern Life Insurance Company; died July 22, aged 66, of cerebral hemorrhage.

William R. S. Denner, Manchester, Md.; Johns Hopkins University School of Medicine, Baltimore, 1908; resident physician at the Western Pennsylvania Hospital, Pittsburgh, 1908-1909; resident pathologist at St. Francis Hospital, Pittsburgh, from 1909 to 1912; at one time served as associate in pathology at the University of Pittsburgh School of Medicine; member of the extraurban staff, Union Memorial Hospital, Baltimore; vice president of the Farmers and Mechanics Bank of Westminster; died July 3, aged 61, of carcinoma of the prostate.

William Henry Egan, New York; Bellevue Hospital Medical College, New York, 1895; served as president of the

reducing a fractured limb depends entirely upon the circumstances of the particular case. The question as to whether the reduction and treatment of a fractured limb without the use of an x-ray machine constitutes negligence depends upon what an ordinarily skilled physician practicing in that vicinity, in the exercise of due care and professional judgment, would be required to do under like circumstances. The determination of those questions depends upon expert testimony. (*Perkins v. Trueblood*, 180 Cal. 437, 443, 181 P. 642; *Arais v. Kalensnikoff* [10 Cal. 2d 428], 74 P. 2d 1043 [115 A. L. R. 163].)

The evidence in this case, continued the court, shows that the physician did know the nature of his patient's injury and there is no evidence that his treatment would or should have been any different if roentgenograms had been taken. Nor is there any showing that his treatment in any way caused the deformation of the finger. The only medical testimony in the case was given by the physician himself to the effect that the present condition of the finger was caused by arthritis. Even assuming that the physician might have discovered the arthritis sooner if he had taken roentgenograms sooner, the failure to do so would constitute a mere error of judgment, not actionable negligence, as was said in *Bickford v. Lawson*, supra:

From a careful reading of the entire record we are convinced that the only omission of which the plaintiff may reasonably complain is a failure to use x-ray pictures after the reducing of the fracture, at an earlier date, with the possibility that the defendant might have thus discovered the lack of callus and that he would then have advised his patient to consult a bone specialist. But the defendant testified that he had no intimation of that lack of callus until the x-ray picture was taken December 20 [two months after the injury]. That omission, if it may be said to have contributed to the injury of the patient, was a mere error in judgment which does not constitute actionable malpractice.

The patient contended that the testimony of the physician himself was sufficient to establish negligence on his part; that there is a material variance between the treatment outlined by him as being in accord with good practice and that actually administered by him as described by the patient. However, said the court, the record does not show any substantial conflict of testimony in this regard. The defendant described in detail his method of applying splints to the injured finger, stating that "the finger was splinted in as full extension as possible, that is, with the finger sticking out straight"; "with two of these splints applied and tape wrapped around them tightly, the finger must be extended straight out, or as near so as it was humanly possible to get it." He further testified, with reference to his first use of a splint, that "at the time this finger was splinted it was still slightly swollen and inflamed from the crushing force of her injury. The finger was brought up in as full extension as possible, and that is all that anybody can do to reduce that type of fracture." (Italics added.) These statements are not inconsistent with plaintiff's assertion that "the finger was not straightened out when the splint was put on"; that "he did put splints on it and left it crooked the way it was at that time, with the splints on, he didn't straighten it out with the splints on." She herself testified that on that occasion "the finger was so swollen still and so crooked that he could not manipulate the finger even yet," from which statement it is manifest that the attainment of full extension was not then possible.

Finally, the patient contended that a jury should have passed on the evidence because of the testimony of herself and of her husband that in the course of a conversation between them and the physician sometime subsequent to the termination of the physician's services he admitted that she had asked him over and over again for "x-ray" and that "I know it is not your fault . . . It is all my own." The general rule, stated the court, is, however, that an admission to be sufficient must be an admission of negligence or lack of the skill ordinarily required for the performance of the work undertaken. *Markart v. Zeimer*, 67 Cal. App. 363, 227 P. 683. Where the admission does not amount to an admission of negligence, it is held that the physician is not responsible. *Phillips v. Powell*, 210 Cal. 39, 290 P. 441, 443. In that case a blade used in making an incision broke and became embedded in the flesh, and testimony was introduced that the defendant had said "It is my fault in using that kind of blade in that kind of an operation." The court there said "We are of the opinion that these statements or otherwise did not constitute admissions that the defendants 'did not possess and use that reasonable degree of learning and skill which was ordinarily possessed by the members of their profession in good standing practicing in their vicinity,' which

is the only standard by which the liability of the defendants may be determined. See *Markart v. Zeimer*, 67 Cal. App. 363, 371, 227 P. 683; *Hesler v. California Hospital Co.*, 178 Cal. 764, 174 P. 654; *Perkins v. Trueblood*, 180 Cal. 437, 181 P. 642." And even where a physician admits that he was in error in the treatment administered (*Donahoo v. Lovas*, 105 Cal. App. 705, 288 P. 698) or that he performed the wrong operation (*Markart v. Zeimer*, supra), it is held that such admissions are not sufficient to establish liability, where the admissions are not of negligence. As said in the latter case [67 Cal. App. 363, 227 P. 686]:

These admissions, therefore, are not admissions that the operation complained of was not performed with reasonable care, or that the defendants did not possess and use that reasonable degree of learning and skill which was ordinarily possessed by the members of their profession in good standing practicing in their vicinity. As a consequence, while they were competent as evidence of such facts as they admitted, they did not supply the absence of expert testimony in such particulars as expert testimony was otherwise required.

Here the alleged admission pertained only to the failure of the defendant to obtain x-rays of the broken finger; and, at most, the uncontradicted evidence shows that x-rays would merely have enabled him to obtain more positive evidence of the nature of the injury sustained, in confirmation of facts with which he was already familiar by observation and palpation. They would not have affected his method of treatment in the least; nor is there any evidence to show that the result would have been any different.

The plaintiff in support of the contention just discussed cited *Scott v. Sciaroni*, 66 Cal. App. 577, 226 P. 827, and *Walter v. England*, 133 Cal. App. 676, 24 P. 2d 930. In both of these cases, the court said, the admissions were of negligence, not of mere mistake, and therefore those cases are not controlling here. In *Scott v. Sciaroni*, supra, the defendant was reported to have said that he left the radium on too long, that it was his fault that the plaintiff was in her present condition. In distinguishing that case, it was said in *Donahoo v. Lovas*, 105 Cal. App. 705, 288 P. 701: "In that case the physician admitted that the condition of the plaintiff was due to his negligence." In *Walter v. England*, 133 Cal. App. 676, 24 P. 2d 934, the defendant stated that he had made a mistake in inserting a hypodermic needle, and it was held: "We are satisfied that, as used by the defendant, the word 'mistake' was synonymous with the word 'negligence.'"

The appellate court accordingly affirmed the judgment of nonsuit entered by the trial court.—*Lashley v. Koerber*, 150 P. (2d) 272 (Calif., 1944).

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics, St. Louis, Nov. 9-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.
- Annual Conference of State Secretaries and Editors, Chicago, Nov. 17-18. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.
- Association of American Medical Colleges, Detroit, Oct. 23-25. Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary.
- Association of Military Surgeons of the United States, New York, Nov. 2-4. Col. James M. Phalen, Army Medical Museum, Washington 25, D. C., Secretary.
- Central Neuropsychiatric Association, Chicago, October 31. Dr. Ernest M. Hammes, 1124 Lowry Medical Arts Bldg., St. Paul 2, Minn., President.
- Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 17-20. Dr. Arthur G. Sullivan, 16 N. Carroll St., Madison, Wis., Managing Director.
- Midwestern Section of American Federation for Clinical Research, Chicago, Nov. 2. Dr. Richard H. Lyons, University Hospital, Ann Arbor, Mich., Secretary.
- Oklahoma City Clinical Society, Oklahoma City, Oct. 23-26. Dr. L. C. McHenry, 512 Medical Arts Bldg., Oklahoma City, Secretary.
- Omaha Mid-West Clinical Society, Omaha, Nebraska, Oct. 23-27. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha 2, Secretary.
- Southern Medical Association, St. Louis, Mo., Nov. 13-16. Mr. C. P. Loran, Empire Building, Birmingham 3, Ala., Secretary.
- Virginia Medical Society of, Richmond, Oct. 23-25. Miss Agnes V. Edwards, 1200 E. Clay St., Richmond 19, Secretary.
- Western Surgical Association, Chicago, Dec. 1-2. Dr. Arthur R. Metz, 250 East Superior St., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis 28:1-132 (July) 1944

- *Heart in Rheumatoid Arthritis. Study of 38 Autopsy Cases. D. Young, and J. B. Schwedel—p. 1
- *Coarctation of Aorta: Clinical and Roentgenologic Analysis of 13 Cases. L. Perlman—p. 24
- Electrocardiographic Study of Lateral Infarction, Proved at Autopsy. C. I. Shaffer—p. 39.
- Effect of Drugs on Surface Capillaries of Macacus Rhesus. R. H. Pelzer and W. Redisch—p. 46
- Electrocardiographic Changes of Impending Infarction, and Ischemia Injury Pattern Produced in Dog by Total and Subtotal Occlusion of Coronary Artery. R. H. Bayley and J. S. La Due—p. 54.
- Observations on Heart Size of Natives Living at High Altitudes. A. J. Kerwin—p. 69
- *Myocardial Infarction Indicated by Angina Pectoris of Effort or by Brief Attacks of Angina of Rest, with Remarks on Premonitory Pain. W. Dressler—p. 81.
- *Continuous Recording Electrocardiography. W. B. Likoff, M. B. Rappaport and S. A. Levine—p. 98.

Heart in Rheumatoid Arthritis.—Young and Schwedel point out that in Europe a common etiologic background for chronic rheumatoid arthritis and rheumatic heart disease has been widely accepted. The prevailing opinion in this country has been that, when chronic structural joint changes and evidence of rheumatic carditis coexist, it is a rare combination of two distinct clinical entities. This concept of an etiologic difference persists because of a lack of postmortem studies on a sufficiently large number of patients with rheumatoid arthritis. The authors report postmortem and clinical data on 38 adults with rheumatoid arthritis. Thirty-three of the patients had cardiac lesions which were not the result of hypertension or coronary artery disease. In 25 of the 33 the process was rheumatic in origin and in the remaining 8 of a nonspecific infectious nature. An active rheumatic process was present in only 6. A history of rheumatic fever was obtained in only 3 cases and of probable rheumatic fever in 2 others. The arthritis was insidious and progressive in 18 cases, and acute attacks of polyarthritis occurred in 15 during the course of the disease. The extremely high incidence of rheumatic heart disease in rheumatoid arthritis which was found in this and previous pathologic studies suggests an extremely close relationship which should lead to consideration of the possibility that they may be manifestations of the same underlying disease process.

Coarctation of Aorta.—Perlman found the incidence of coarctation of the aorta in adults to be 1 in 10,000, as contrasted with 1 in 1,500 in reports of other investigators. He reports 13 cases detected in the course of routine physical examinations for army service of an unselected group of men between the ages of 18 and 35 years. In only 3 of the 13 cases were pulsations of the femoral artery present. In only 1 of the 3 was the femoral impulse of moderate intensity, and even in this instance the impulse did not approach the intensity of the radial artery pulsation. In the remaining 2 cases the femoral artery pulsation might be classed as slight. The basal diastolic was the predominant cardiac murmur. Although the diagnosis of coarctation of the aorta may be made clinically, the roentgenogram is a valuable diagnostic aid. In some cases confirmatory evidence from the roentgenogram is essential for the diagnosis. The characteristic radiologic syndrome consists of (1) absence of the aortic knob, (2) dilatation of the ascending and transverse portions of the arch of the aorta, (3) erosion of the lower margin of the posterior portions of the ribs and (4) roundness or enlargement of the left ventricle. The only constant radiologic signs in this series were absence of the aortic knob and erosion of the ribs.

Myocardial Infarction Indicated by Angina Pectoris.—Dressler reports 16 cases in which there was clinical and laboratory evidence suggestive of myocardial infarction in the absence of characteristic, severe and protracted anginal attacks. In 9 cases myocardial infarction was indicated by the sudden onset or aggravation of angina of effort; in 7 it was clinically signalized by brief attacks of angina of rest, lasting up to twenty minutes. The seriousness of such atypical anginal manifestations is often unrecognized, and proper management of the patient is neglected. Sudden death is frequent in this group. A painstaking history, including an accurate estimate of the functional capacity of the heart and a comparison of present and past performances, furnishes the most significant diagnostic data. An increase in the sedimentation rate is often a more sensitive index of myocardial necrosis than the electrocardiographic changes. Lack of the latter should never be considered as conclusive evidence against serious myocardial involvement. Anginal pain of the type described has often been designated as "premonitory pain" which precedes the development of "actual myocardial infarction." The author's experience, as well as reports in the literature, proves that "premonitory pain" is not invariably followed by typical anginal attacks signifying myocardial infarction. "Premonitory pain" is often by itself associated with evidence of myocardial necrosis. The distinction between "premonitory pain" and "actual myocardial infarction" is inappropriate. A sudden onset or aggravation of angina of effort, or brief attacks of angina of rest, indicates progressive coronary insufficiency and is in the majority of cases associated with ischemic myocardial necrosis.

Continuous Recording Electrocardiography.—Likoff and his collaborators present a description of a continuous recording electrocardiograph. The apparatus is capable of taking a miniature record one-twentieth normal size on ordinary moving picture film and of functioning for 267 hours without the attention of an operator. A simple enlarger was devised to view the miniature record at normal size and to make suitable photographic reproductions. The apparatus is as accurate and sturdy as the ordinary portable electrocardiograph. Several interesting observations have been noted thus far. Ventricular fibrillation has been found to follow, rather than precede, death in some cases. Electrocardiographic curve generally regarded as indicative of ventricular fibrillation have been observed to occur while heart beats were audible and therefore are better designated as ventricular flutter.

American Journal of Clinical Pathology, Baltimore 14:307-362 (June) 1944

- Qualitative and Quantitative Studies on Antithrombic Activity of Blood Serum and Plasma. S. J. Wilson—p. 307.
- Simple Method of Staining Malaria Protozoa and Other Parasites in Paraffin Sections. W. J. Tomlinson and R. G. Grocott—p. 316.
- Serum Proteins in Diseases of Heart and Kidneys. B. M. Kagan—p. 327.
- Effect of Small Doses of Alcohol on Central Nervous System. N. Enzer, E. Simonson and Grace Ballard—p. 333.
- Salmonella Pneumonia. M. G. Levine and E. B. Plattner—p. 342.
- Attempt to Desensitize Against Tuberculoallergic Allergy. H. J. Corper and M. L. Cohn—p. 344.
- Evaluation of Clinical Laboratory Tests for Pathogenic Staphylococci Based on Histologic Examinations of Lesions in Tissues. P. R. Beamer, I. I. Goodof and E. B. Smith—p. 350.
- *Use of Buffy Layer in Rapid Diagnosis of Septicemia. A. A. Humphrey—p. 358.

Buffy Layer in Rapid Diagnosis of Septicemia.—Smears from the "buffy layer" or "leukocytic cream" have been employed to facilitate leukocytic differential counts in leukopenic conditions. Malarial parasites are more numerous in the red cells in this layer, owing to their decreased mass. Humphrey describes demonstration of the causative organism of septicemia in this layer in the following manner. At the time of withdrawing blood for culture, 4 to 7 cc. of blood is placed in a narrow tube which contains some dry oxalate crystals. After mixing the blood and the oxalate by shaking, the tube is centrifuged at high speed for thirty minutes. The plasma is gently removed from the packed erythrocytes and overlying buffy layer with a capillary pipet, care being taken not to disturb the latter. The layer is then gently scraped off the underlying red cell strata with a small loop or is sucked up with a

capillary pipet and smeared over slides, which are stained with Gram's stain in the usual manner. It is advisable to stain one slide with Wright's blood stain, as it was found that gram negative diplococci were more readily found in such preparations and their gram staining characteristics could later be checked. While in some cases several intracellular and extracellular bacteria were observed in one field, others required close examination for almost an hour before definite bacterial forms could be seen. The author describes 6 cases in which this method was employed. The advantage of this procedure is that rational therapy can be instituted within an hour after the clinical diagnosis of septicemia is made, making it unnecessary to wait forty-eight or seventy-two hours until a blood culture becomes positive. The procedure is intended to supplement the blood culture.

American J. Obstetrics and Gynecology, St. Louis 48:1-148 (July) 1944. Partial Index

- *Chemistry of Ovarian Cysts. Ruth M. Watts and F. L. Adair.—p. 1.
- Cesarean Section Morbidity and Septic Mortality in Relation to Type of Operation. C. C. Briscoe.—p. 16.
- Zondek's Simplified Treatment of Secondary Amenorrhea. Rita S. Finkler.—p. 26.
- *Cord Transfusions in Newborn Infants. H. W. Mayes.—p. 36.
- Prognosis and Management of Premature Rupture of Membranes. E. H. Bishop.—p. 45.
- Clinical Significance of Midplane Pelvic Contraction. H. Thoms and P. C. Schumacher.—p. 52.
- Study of Endometrial Pattern Before and After Treatment for Amenorrhea. W. Bickers.—p. 58.
- Genital Tuberculosis in Female. R. L. Haas.—p. 69.
- *Frequency of Anovulatory Menstruation as Determined by Endometrial Biopsy. A. B. Levan and P. B. Szanto.—p. 75.
- Analgesia and Anesthesia for Obstetrics: Inhalation Methods. W. A. Conroy.—p. 81.
- Local Anesthesia. H. Buxbaum.—p. 90.
- Continuous Caudal Anesthesia with Pontocaine: Obstetrician's Viewpoint. J. E. Fitzgerald, J. M. Thomson and H. O. Brown.—p. 94.
- Continuous Caudal Anesthesia with Procaine Hydrochloride in 240 Obstetric Patients. W. F. Mengert.—p. 100.
- Continuous Caudal Analgesia in Obstetrics: Commentary. A. Baptisti Jr.—p. 103.
- Cyclopropane-Pituitrin Incompatibility. S. Belinkoff.—p. 109.

Chemistry of Ovarian Cysts.—Watts and Adair determined the sodium, potassium, chloride, nitrogen, nonprotein nitrogen, protein, glucose, total solid, water, ash and specific gravity of 29 ovarian cyst fluids from 15 ovarian tumors (9 benign and 6 malignant); fluids from 3 parovarian cysts have been examined. Values vary greatly not only among the fluids of different types of cysts but also between the fluids of the different cavities of the same tumor. The composition of the fluid seems to vary with the secretory activity of the lining of the cyst. In general, fluids from cysts with actively secreting epithelium and a cellular basal layer are high in nitrogen and protein, high in potassium and low in chloride; those with less actively secreting epithelium, or a cyst wall which is denuded or attenuated and in which the basal layer is avascular or hyalinized, show low nitrogen and protein, low potassium and high chloride.

Cord Transfusions in Newborn Infants.—Mayes made 34 cord transfusions in newborn infants; 18 in infants weighing less than 5½ pounds, gestation from 23 to 39 weeks; 16 in infants weighing 5½ pounds and over, 13 full term, 3 with gestation of 36 weeks or under. There were 4 deaths, 3 in the smaller weight group, 1 in the larger. The citrated blood to be given should be in readiness before the baby is delivered. A 50 cc. syringe is used in which is 5 cc. of a 2 per cent solution of sodium citrate. The blood is withdrawn and the syringe tilted several times to mix the citrate solution with it. If the mother is toxic or if for any other reason her blood is not desirable, blood from the father, from some other donor or from the bank may be used. As soon as the baby is born and before cutting the cord, the umbilical vein may be entered with the same needle used to withdraw the blood. If preferred a cannula may be placed in the vein. The transfusion should be started as far from the baby as possible. This serves two purposes: If the vein is not easily entered, another attempt can be made nearer the baby; if the baby should move, the needle will not be disturbed. As soon as the transfusion is started the cord should be clamped between the needle and the placenta.

If it is decided to cut the cord before giving the transfusion, the cord may be gently compressed near the umbilicus, so that the veins remain distended. The transfusion should be given slowly, 30 or 40 cc. in about five minutes. About 10 cc. per pound of baby is sufficient. Premature infants and particularly those usually considered nonviable are benefited. In infants suffering from difficult delivery and those in doubtful condition, a small transfusion of 20 cc. of mother's blood acts as a direct stimulation to the respiratory center and tends to overcome a tendency toward hemorrhage. If the mother gives a history of previous stillbirths or if hemorrhagic disease or erythroblastosis is suspected, cord transfusions may be of benefit.

Frequency of Anovulatory Menstruation as Determined by Endometrial Biopsy.—Levan and Szanto took endometrial biopsies from 103 women at the Kankakee State Hospital. All had regular menstrual periods. Biopsies were taken twenty days or more following the last menstrual period. The specimens were stained with hematoxylin and eosin. In doubtful cases Best's carmine stain for glycogen and the thionin stain for mucin were used. The authors obtained 261 endometrial biopsies during the last third of the menstrual cycle from 103 women. Fourteen anovulatory cycles were found in 9 patients. Two patients showed successive anovulatory cycles; 7 patients showed both anovulatory and ovulatory cycles. The incidence of anovulatory cycles was 5.36 per cent; the patients with anovulatory cycles amounted to 8.7 per cent of the total number examined. Parity was not found to be a factor, but women past 40 years of age showed a higher incidence of anovulatory menstruation. While all the women in this group are psychotic, the incidence of anovulatory menstruation in them compares quite closely with that found in normal, healthy women.

American Journal of Surgery, New York 65:1-152 (July) 1944

- Adenoma of Kidney: Report of 6 Cases. C. C. Higgins.—p. 3.
- Pilonidal Cysts: Subcutaneous Excision Beneath Definitely Placed Flaps. G. L. Carrington.—p. 15.
- Reconstructive Surgery of Nose in Congenital Deformity, Injury and Disease. E. S. Lamont.—p. 17.
- Nontuberculous Lung Abscesses: Survey of 417 Cases. V. D'Ingianni.—p. 46.
- Congenital Hemolytic Icterus: Surgical Treatment of Complications with Report of 2 Cases. E. O. Horne.—p. 56.
- Salpingitis and Tubal Patency. F. L. Schwartz.—p. 65.
- *Plasma Fixation of Skin Grafts. J. E. Sheehan.—p. 74.
- Surgical Relief of Hypoglycemic State Probably Due to Organic Hyperinsulinism. G. E. Pfeiffer and L. H. Eisendorf.—p. 79.
- Hemorrhoids: Surgical versus Injection Treatment. D. N. Yaker.—p. 88.
- Some Uses for Heavy Anesthetic Oils. H. M. Kirschbaum.—p. 91.
- X-Ray Treatment of Sinusitis. F. T. Munson and H. T. Munson.—p. 95.
- Alar Scapula: An Unusual Surgical Complication. M. U. Prescott and R. W. Zollinger.—p. 98.
- Gastric Ulcer, Benign or Malignant: Review of Recent Literature. H. M. Wiley.—p. 104.
- *Peptic Ulcer Perforating Into Anterior Abdominal Wall. C. G. Morlock and W. Walters.—p. 133.

Plasma Fixation of Skin Grafts.—Sheehan directs attention to the change in the technic of skin grafts introduced by Sano of Temple University (abstract in THE JOURNAL, Dec. 25, 1943, p. 1143). Painting the host site with the patient's own plasma and the graft with leukocyte cell extract makes the adhesion perfect, sutures are unnecessary, the degree of pressure is no longer a problem and the circulation within the graft is established so rapidly that overlapping edges bleed when cut on the second day. On the fourteenth day definite recovery is achieved and in two months the graft is indistinguishable in coloration or by its boundaries from the neighboring skin. It is not good practice to have the skin edges overlap the defect. In cutting it away an unsatisfactory apposition at the defect skin edges is inevitable. Stretching by roller pressure, on the contrary, banks the graft edges accurately against those of the defect, a little cardboard and hand pressure is added and the approximation is maintained sufficiently by means of a few clamps. Adhesion is immediate and complete. The compound was able to seal wounded liver tissues in which suturing leads only to bleeding and to be of equal effect when employed on wounds of the spleen. It is invaluable in facial injuries in which there are flaps of torn skin whose immediate return is

of high importance and in the elimination of disfiguring scar. It should make possible the closure of many not too large wounds without sutures. It offers great hope of application in many situations, as in the face and hands.

Peptic Ulcer Perforating into Abdominal Wall.—Morlock and Walters observed a jejunal ulcer which had perforated into the anterior abdominal wall. Two similar cases were found in the files of the Mayo Clinic. All of the 3 patients had had a previous anterior gastrojejunostomy. In each instance the offending lesion was an ulcer arising in the anterior rim of the anterior gastrojejunal stoma. In order that a peptic ulcer may attach itself to the anterior abdominal wall and penetrate into it the ulcer must have its origin from a part of the stomach wall which is adjacent to the abdominal wall. A gastrojejunal ulcer arising on the anterior rim of an anterior gastrojejunal stoma is therefore peculiarly likely to penetrate in such a way as to result in this complication. In the surgical treatment of duodenal ulcer, posterior anastomosis is always done in preference to the anterior anastomosis. A better functional result is achieved by the former procedure. Anterior gastrojejunostomy is done only when posterior anastomosis is not technically feasible, and this is uncommon. For these reasons few gastrojejunal ulcers are situated in a location which makes penetration of the ulcer into the anterior abdominal wall anatomically possible. Although it is possible for a gastric ulcer having its origin in a part of the anterior gastric wall adjacent to the anterior abdominal wall to penetrate into the abdominal wall, this complication must be exceedingly rare in a stomach which has not been previously disturbed by operation. In 1 case 2 ulcers were found to penetrate into the anterior abdominal wall; 1 had its origin in the gastric wall; the other arose from the jejunum. Peptic ulcer which perforates into the anterior abdominal wall must be treated surgically.

Annals of Otol., Rhin. and Laryngology, St. Louis 53:207-380 (June) 1944. Partial Index.

- Critical Review of Patients Subjected to Labyrinth Operations H. I. Lillie—p. 207.
Teaching Otolaryngology in Wartime H. P. Schenck—p. 221.
Local Use of Sulfadiazine Solution, Radon, Tyrothionin and Penicillin in Otolaryngology. S. J. Crowe—p. 227.
Mucocoele in Frontal and Ethmoid Sinuses: Simplified Surgical Treatment H. M. Goodyear—p. 242.
Histologic Otosclerosis S. R. Guild—p. 246.
Vitamins in Otolaryngology. H. B. Perlman—p. 267.
Traumatic Deformities of Nasal Septum S. Salinger—p. 274.
Intranasal Vaccine for Prevention of Colds D. W. Cowan and H. S. Dichi—p. 286.
Aeromoniasis—Its Cause, Course and Treatment P. A. Campbell—p. 291.
Extralaryngeal Surgical Approach for Arytenoidectomy. Bilateral Abductor Paralysis of Larynx H. B. Orton—p. 303.
Temporal Arteritis H. J. Profant—p. 308.

Archives of Ophthalmology, Chicago 32:1-88 (July) 1944

- *Pathogenesis of Intermittent Exophthalmos F. B. Walsh and W. E. Dandy—p. 1.
*Keratectomies for Treatment of Corneal Opacities R. Castroviejo—p. 11.
Treatment of Glaucoma P. A. Chandler—p. 23.
Industrial Injuries of Eye E. S. Sherman—p. 33.
Lipemic Retinitis in Nondrabetic Patient C. W. Leppard—p. 37.
Juvenile Amyotrophic Familial Idiocy: Its Ocular Pathology. I. Ginner and L. Roizin—p. 39.
Intracapsular Extraction of Senile Cataract M. D. Patawa—p. 48.
Intraocular Pressure and Its Relation to Retinal Extravasation J. Igersheimer—p. 50.
Defects in Visual Fields Produced by Hyaline Bodies in Optic Disks C. W. Rucker—p. 56.
Tuberculous Sclerosis Associated with Tumor of Optic Disk (Phacomia) F. A. Glicklied, A. Schultz and J. E. Benjamin—p. 60.
Chorioiditis Lenticis Associated with Traumatic Lenticulus Posterior F. Rosen—p. 63.

Pathogenesis of Intermittent Exophthalmos.—According to Walsh and Dandy intermittent exophthalmos is characterized by rapid protrusion of one eye when venous stasis is induced by bending the head forward, by lowering the head, by turning the head forcibly, by hyperextension of the neck, by coughing, by forced expiration with or without compression of the nostrils and by pressure on the jugular veins. The ocular protrusion disappears immediately when the head is erect and when arti-

ficially induced venous congestion is relieved. Usually there is enophthalmos when venous congestion does not exist. Pulsation of the eyeball may or may not be present, and vision may or may not be affected. The condition is progressive and may be productive of unbearable pain and troublesome diplopia. The authors report a case in which the quick protrusion and sinking of the eyeball with the postural changes, and the rapid protrusion induced by coughing, sneezing and jugular compression could mean only the filling of a large venous bed. The pulsation of the eyeball indicated an arterial component. The lesion was considered to be an arteriovenous aneurysm. The enophthalmos (with the patient, a girl aged 18, sitting or standing) was thought to be due to atrophy of the orbital fat from long continued pressure. A transcranial approach disclosed an intracranial arteriovenous aneurysm lying in and behind the sphenoid fissure. The case is the only one in the literature in which a cause for this rare syndrome has been disclosed. An arteriovenous aneurysm of similar type is probably responsible in all cases for pulsation of the eyeball. In most recorded cases pulsation was absent or missed. Whether or not there are two types of this syndrome, one with and the other without pulsation, cannot be determined without subsequent pathologic studies. The intermittent exophthalmos was cured by obliterating the aneurysm with the electrocautery, but blindness of the affected eye and ophthalmoplegia resulted.

Keratectomies for Treatment of Corneal Opacities.—Castroviejo states that among the corneal opacities covering the pupillary area there are some susceptible of treatment by corneal transplantation, which gives the best results as far as improvement of vision is concerned. There are other superficial opacities in the pupillary area which, although lending themselves to treatment by corneal transplantation, are best handled by other surgical procedures which expose the eye to fewer complications. For some of these conditions superficial keratectomy is the preferred procedure. Keratectomy may be partial, when only a limited area of the external lamella of the cornea is excised, or total, when the excision extends over the whole area of the cornea. The author performs a partial superficial keratectomy for band keratitis, for dystrophica adiposa corneae and for leukoma. He employs total superficial keratectomy for vascularized leukoma. Total superficial keratectomy together with corneococonjunctival plastic surgery is carried out in vascularized leukoma and symblepharon. Occasionally in cases of severe symblepharon the author combines partial superficial keratectomy, corneococonjunctivoplasty and graft of the buccal mucous membrane. He employs partial superficial keratectomy and graft of the buccal mucous membrane for the treatment of recurrent pterygium. In selected cases superficial keratectomy offers the ideal method of improving visual acuity. Penicillin ointment has been found to shorten the period of healing and reduce the occurrence of infection.

Connecticut State Medical Journal, Hartford 8:483-580 (Aug.) 1944

- Common Industrial Solvents and Their Systemic Effects. W. J. von Oettingen—p. 485.
Development of Psychiatric Service and Its Relation to Returned Veteran J. M. Cunningham—p. 493.
Erythroblastosis Fetalis: Its Etiology and Diagnosis H. C. Miller—p. 499.
Rh Factor in General Medicine R. D. Johnson—p. 502.
Practical Importance of Rh Blood Type and Project for Collection and Preparation of Rh Typing Serum L. K. Diamond—p. 505.
Hartford Circus Fire Disaster: Organization of State E. M. S. of War Council at State Armory, Hartford, July 6—July 9, 1944 During Crisis G. M. Smith—p. 507.
Id. Report of Hartford Catastrophe Fire at Barnum and Bailey Circus Grounds, July 6, 1944, Between 2 25 and 2 30 p. m. J. J. Bourke—p. 509.
*Id. Hartford Circus Fire Patients in Hospitals S. B. Weld—p. 511.

Hartford Circus Fire Patients in Hospitals.—Because of its proximity to the scene of the disaster, the Municipal Hospital received the first and, in the end, the largest number of patients. During the following eight minutes 143 patients were admitted. Of this number 5 were dead on arrival, 6 others were so severely burned that they died within an hour after admission, 42 were treated in the outpatient department and 76 were receiving treatment up till 8 p. m., when 22 of the least seriously burned were transferred in U. S. Army ambulances to

Hartford and St. Francis hospitals. The procedure at the Municipal Hospital was similar to that followed in the other hospitals. All patients were given morphine subcutaneously on admission. Plasma was administered intravenously under considerable difficulty, owing to the badly burned condition of the skin on the extremities and to destruction or collapse of superficial veins. It was often necessary to cut down on the femoral veins. The dressing teams applied petrolatum impregnated gauze to all burned areas without débridement. These dressings were covered with light plaster casts for even pressure and changed the following day to Acc bandages. A tetanus detail tested patients for reactors and gave prophylactic injections. Sulfonamides were administered during the first twenty-four hours together with forced fluids by mouth, if tolerated. Parenteral fluids were necessary in many instances because of nausea. Patients developing fever on the second day were given penicillin in liberal doses. This major disaster found Hartford ready to meet the task imposed. When the facts are tabulated and analyzed there will be on record not only data of inestimable value to medical science but evidence of the necessity for a permanent comprehensive emergency organization.

Diseases of Chest, Chicago

10:277-390 (July-Aug.) 1944

- New Growths of Chest. C. W. Tempel.—p. 277.
Lung Resection for Chronic Pulmonary Infection. R. Davison.—p. 313.
Relative Importance of Anatomic and Physiologic Concept in Tuberculosis. J. D. Riley.—p. 317.
Treatment of Tuberculous Cervical Adenitis with Vitamin A and D Ointment. W. Raab.—p. 326.
Chest Diseases in Aged. A. S. Anderson.—p. 329.
Treatment of Pneumonia with Sulfonamide Drugs. J. Reiss and A. C. Cohen.—p. 337.

Gastroenterology, Baltimore

2:385-470 (June) 1944

- Benign Diseases of Small Intestine. B. B. Crohn.—p. 385.
Diseases in Tropical War Zones: IV, Diseases of Middle East, India, Assam and Burma. E. C. Faust.—p. 395.
Pancreas: Contributions of Clinical Interest Made in 1943. R. Elman and J. T. Akin Jr.—p. 412.
Indigestion Due to Constipation. W. C. Alvarez.—p. 427.
*Role of Liver and Gallbladder in Excretion in Dog of Some of Newer Sulfonamides. H. Shay, S. A. Komarov, H. Siplet and S. S. Fels.—p. 432.
Effect of Prolonged Administration of Enterogastrone on Gastric Secretion in Normal and Mann-Williamson Dogs. M. I. Grossman, H. Greengard, D. F. Dutton and J. R. Woolley.—p. 437.

Liver and Gallbladder in Excretion of Sulfonamides.—Shay and his associates investigated sulfanilylguanidine, succinylsulfathiazole, phthalylsulfathiazole and sulfathiazole. Experiments carried out on 30 dogs demonstrated that sulfathiazole is concentrated by the dog's liver in a constant relationship to the blood level, the ratio being independent of the blood concentration. The introduction of the succinyl radical into the sulfathiazole molecule at N¹ resulted in a considerable increase in the hepatic bile/blood concentration ratio, while the introduction of the phthalyl radical in the same position increased the ratio many times more, so that the removal from the blood of the latter compound by the liver reaches a high degree of selectivity. Sulfaguanidine appears to be excreted by the liver at approximately the blood level. Phthalylsulfathiazole appears to be partially broken down in the dog's liver with the liberation of a free sulfonamide, presumably sulfathiazole. The normal dog's gallbladder concentrates sulfathiazole, succinylsulfathiazole and phthalylsulfathiazole in proportion to water absorbed from the bile. It neither excretes nor absorbs any of these drugs but is able to absorb sulfaguanidine.

Indiana State Medical Assn. Journal, Indianapolis

37:342-386 (July) 1944

- Primary Tuberculosis. E. W. Custer.—p. 341.
Modern Treatment of Cyanide Poisoning. K. K. Chen, C. L. Rose, G. H. A. Clowes.—p. 344.
Clinical Symptoms of Typhoid Fever in 9 Cases. V. C. Miller.—p. 351.
Medical Records and Record Keeping in Industry. S. L. Rankin.—p. 352.
T Stack for Artery Forceps. F. E. Hagie.—p. 339.

Journal of Experimental Medicine, New York

80:1-76 (July) 1944

- Significance of Antigenic Differences Among Strains of "A Group" of Influenza Viruses. T. P. Magill and J. Y. Sugg.—p. 1.
*Histopathology of Progressive Muscular Dystrophy as Revealed by Ultraviolet Photomicrography. C. L. Hoagland, R. E. Shank and G. I. Lavin.—p. 9.
Constitution of Mitochondria and Microsomes, and Distribution of Nucleic Acid in Cytoplasm of Leukemic Cell. A. Claude.—p. 19.
Biliary Excretion of Radioactive Iron and Total Iron as Influenced by Red Cell Destruction. W. B. Hawkins and P. F. Hahn.—p. 31.
Poliomyelitis in Cynomolgus Monkey: III. Infection by Inhalation of Droplet Nuclei and Nasopharyngeal Portal of Entry, with Note on This Mode of Infection in Rhesus. H. K. Faber, Rosalie J. Silverberg and L. Dong.—p. 39.
Experimental Streptococcus Moniliformis Arthritis in Chick Embryo. G. J. Buddingh.—p. 59.
Certain Conditions Determining Enhanced Infection with Rabbit Papilloma Virus. W. F. Friedewald.—p. 65.

Histopathology of Progressive Muscular Dystrophy Revealed by Ultraviolet Photomicrography.—According to Hoagland and his associates morphologic studies of diseased muscle have yielded little information concerning the fundamental defect responsible for the extensive atrophy and dystrophy in the primary muscle disorders. The recent development of a simplified quartz microscope with the 2,537 angstrom line of mercury as the light source has made it possible to obtain ultraviolet photomicrographs of tissues fixed, embedded and sectioned by routine methods. Differences in the absorptive capacity of the organic components of tissue may be expected to result when photographed with the 2,537 angstrom line of mercury. The proteins have a maximum absorption at 2,800 angstroms and the nucleoproteins in the region 2,600 to 2,700 angstroms. Nucleic acid has a maximum absorption at 2,600 angstroms with an extinction coefficient from thirty to sixty times that of the proteins. Changes in tissue structure which result from differences in distribution or concentration should be readily detected by this method. Results, therefore, which are quite different from those obtained with conventional staining technic may be expected, since the ultraviolet photomicrographs are a reflection principally of the chemical nature of the material, while photomicrographs of stained sections reflect merely the absorptive capacity of the dyes used in staining. The authors report a histopathologic study of material obtained from fifteen biopsies of muscle of patients with progressive muscular dystrophy. An exact description of the microscopic changes occurring in this syndrome as revealed by photomicrographs in ultraviolet light is difficult at this time because of lack of an adequate system of nomenclature. Attention has been drawn to lesions of consistent character found in sections of muscle removed at biopsy which appear to be specific for the disease.

Journal of Lab. and Clinical Medicine, St. Louis

29:673-784 (July) 1944

- Coronary Disease Associated with Short PR Interval and Prolonged QRS: Case Report. S. A. Leader.—p. 673.
Vertigo and Related Conditions: New Therapeutic Concept. M. Eliaser Jr.—p. 680.
Reversibility of Sensitization of Erythrocytes. G. M. Kalmanson and J. J. Bronfenbrenner.—p. 684.
Note on "Digestion" of Metal in Stomach. H. Necheles and W. H. Olson.—p. 687.
Adjuvant Effect of Aerosol on Germicidal Action of Cadmium Chloride. A. F. Coca.—p. 689.
*Treatment and Control of Epidermophytosis and Bromidrosis in State School with Cadmium Chloride-Aerosol Solution. G. W. T. Watts.—p. 692.
Manual and Mechanical Resuscitation in Experimental Asphyxia. D. Steinberg and A. Dietz.—p. 695.
Botulism from Home Canned Beets. Betty L. Hall.—p. 702.
Waterhouse-Friderichsen Syndrome: Report of Case Terminating in Recovery. H. W. Potter and L. H. Bronstein.—p. 703.
Therapy of Migraine by Electrolytes Affecting Blood Volume. C. Pfeiffer, R. H. Dreisbach and C. C. Roby.—p. 709.
Cardiotoxic Substances in Blood and Heart Muscle in Uremia (Their Nature and Action). W. Raab.—p. 715.

Cadmium Chloride-Aerosol Solution in Treatment of Epidermophytosis and Bromidrosis.—Watts administered cadmium chloride-aerosol solution to 70 patients with intertriginous epidermophytosis. The treatment was continued daily for from two to four weeks; the itching was controlled and the drying effect of the solution was observed after a few days.

All patients were cured under this regimen. The 14 patients with hyperkeratotic type of epidermophytosis were required to soak their feet in the cadmium chloride-aerosol solution ten minutes daily, after which the feet were massaged vigorously, thereby removing much of the infected epidermis. To date none of these patients have been cured, but they show improvement. The solution was nonirritating. Two cases of epidermophytosis of the hands and 1 case of tinea circinata were successfully treated. Sixteen female patients who suffered severely from bromidrosis, manifested as odorous underarm perspiration, were treated by bathing and applying the solution under the arm with the finger tips. The results have been highly satisfactory in all. Treatment with cadmium chloride-aerosol solution completely controlled the objectionable odor in 6 cases of bromidrosis of the feet.

Journal of Neurosurgery, Springfield, Ill.

1:227-298 (July) 1944

- *Repair of Cranial Defects with Tantalum. R. C. L. Robertson.—p. 227.
Swivel Connection for Brain Suction Tip to Relieve Torsion Strain of Rubber Tubing. H. C. Dahleen.—p. 237.
Experimental Study on Use of Tantalum in Subdural Space. N. C. Delarue, E. A. Linell and K. G. McKenzie.—p. 239.
Dark Adaptation, Negative After Images, Tachistoscopic Examinations and Reaction Time in Head Injuries. J. Ruesch.—p. 243.
Cerebellar Medulloblastoma with Verification Nineteen Years After Onset of Symptoms. F. D. Ingraham and O. T. Bailey.—p. 252.
Paralysis in Flexion and Tremor in Monkey Following Cortical Ablations. W. K. Welch and Margaret A. Kennard.—p. 258.
Microcephalus Secondary to Birth Trauma. E. F. Fincher.—p. 265.
*Differential Diagnosis of Intraspinal Tumors and Protruded Intervertebral Disks and Their Surgical Treatment. J. G. Love.—p. 275.
*Intelligence Following Prefrontal Lobotomy in Obsessive Tension States. J. W. Watts and W. Freeman.—p. 291.

Repair of Cranial Defects with Tantalum.—According to Robertson, tantalum is a heavy metal with a density about twice that of steel. Its chemical inertia obviates reactions to body fluids. Tantalum is workable when cold but cannot be cast. Strength and thermal conductivity are approximately those of steel. Tantalum sheet metal from 0.015 to 0.02 inch thick has been used to repair skull defects at Brooke General Hospital, Fort Sam Houston, Texas. Two methods of cranioplasty with tantalum have been used: a two stage operation and a one stage procedure. In the former the bed for the plate is prepared by mortising the periphery of the bone defect. A shelf is made in the outer table by chisel or burr 2 to 3 mm. beyond the limit of the defect. An impression of the defect and details of the margin of bone is obtained. A wax model is made duplicating the contour of the portion of the skull to be replaced. From this positive a die and counter die are made to swage the metal to conform to size, shape and contour of the missing bone. At a secondary operation the plate is placed in the previously prepared bed and fixed in position. The more frequently employed and highly satisfactory method is a one stage procedure. The bed is prepared as described. The approximate size segment of tantalum is molded by bending and shaping or more frequently by "beating" to contour. Then the exact outline is cut with heavy scissors to conform to the outline of the mortised defect. One border of the plate is engaged into the shoulder of the mortise and, by slight bending and forcing the opposite border into its corresponding shoulder the plate will fit so well when it has flattened out as a result of its inherent spring that it will lock itself into position. Fixation of the tantalum replacement may be accomplished by wire suture or by using small triangular trimmings of the tantalum sheet, utilizing the principle of glazier's points. Tantalum cranioplasty has been done on 26 service men. The author stresses the ease with which the cranial repair has been made, the efficiency of the repair and the cosmetic results. Four illustrative cases are reported in detail. The chief advantages of tantalum from a surgical point of view are its chemical and electrical inertia and ductility.

Differential Diagnosis of Intraspinal Tumors and Protruded Intervertebral Disks.—Love argues that if diagnostic errors are to be kept at a minimum the mistake should not be made of considering every intractable low back and sciatic pain as being due to a protruded intervertebral disk. Trauma

may initiate symptoms of intraspinal neoplasm as well as those of a protruded intervertebral disk. It is important in planning and executing the operation for relief of intraspinal pressure to know which of the following is indicated: relatively extensive laminectomy for removal of a tumor or a relatively short operation, with little or no sacrifice of bone, for removal of a protruded intervertebral disk. The author and his colleagues at the Mayo clinic encountered many intraspinal neoplasms masquerading as protruded intervertebral disks. In some cases the mimicry was so close that the differential diagnosis could not be made until the space taking lesion had been uncovered at the operating table, in spite of the fact that every patient suspected of having a protruded intervertebral disk is subjected in addition to a general physical, orthopedic and neurologic examination. In an analysis of the records of 26 cases of tumor of the spinal canal in which symptoms of root pain suggested irritation or compression of the spinal cord or nerve roots by a protruded intervertebral disk it was found that diagnostic spinal puncture, with or without visualization of the spinal canal, was essential to diagnosis and to localization of the intraspinal lesion. In 15 cases of tumor of the spinal canal it was found that in 8 the symptoms were misleading in that they suggested a protruded intervertebral disk. Also during the period when these 15 patients came to operation 100 other patients were subjected to operation for protruded intervertebral disks. In any case of unexplained, intractable root pain and in almost every case in which a protruded intervertebral disk is suspected diagnostic lumbar puncture should be performed and the protein content of the cerebrospinal fluid should be determined. A value for spinal fluid protein of more than 100 mg. per hundred cubic centimeters usually means a neoplasm rather than a protruded intervertebral disk.

Intelligence Following Prefrontal Lobotomy.—Watts and Freeman base their conclusions regarding prefrontal lobotomy on 45 patients observed from six months to seven years after operation. In the patients under discussion it was the emotional charge rather than the peculiar ideas themselves that caused the disability. Before operation only 17 per cent were leading useful lives. At the present time 67 per cent are leading useful lives. The authors present the histories of 2 patients with obsessive compulsive states and of 2 patients with tension states who underwent prefrontal lobotomy. They conclude that pragmatic intelligence is improved by prefrontal lobotomy in persons disabled by obsessive tension states.

Missouri State Medical Assn. Journal, St. Louis

41:131-158 (July) 1944

- Acute Cor Pulmonale Complicating Tularemia: Report of Case. J. A. Ossman and J. DeV. Guyot.—p. 131.

41:159-178 (Aug.) 1944

- Hematuria, Its Diagnosis and Treatment. D. K. Rose.—p. 159.
Saunders' Theory on Etiology of Poliomyelitis. J. Zahorsky.—p. 162.
Necrotic Uterine Fibromyoma Complicating Pregnancy: Case Report. N. A. Schneider.—p. 164.

Nebraska State Medical Journal, Lincoln

29:233-264 (Aug.) 1944

- Gallbladder and Duct Disease: Surgical Indications and Results. R. L. Sanders.—p. 236.
Remarks on Incidence, Manifestations and Treatment of Nutritional Deficiency Diseases. W. B. Bean.—p. 241.
Rupture of Bladder. P. Adams.—p. 245.
Virus Diseases. L. O. Vose.—p. 247.

Ohio State Medical Journal, Columbus

40:613-708 (July) 1944

- Some Phases of Prevention Program for Poison Ivy Dermatitis. L. Goldman.—p. 629.
Vagaries in Diagnosis and Treatment of Pernicious Anemia. F. Myers.—p. 635.
Postoperative Care and Complications of Gynecologic Patients. R. L. Faulkner and E. A. Riemen-Schneider.—p. 639.
New Methods of Anesthesia and Their Application in Office Practice. N. E. Lenahan.—p. 643.
Plastic Shelf Operation for Dislocated Hips. F. B. Roberts.—p. 659.
Bilateral Renal Carcinoma. M. Lubert.—p. 657.

renal agenesis are reported. Fourteen of these occurred in a series of 27,000 necropsies at the Los Angeles County Hospital, a ratio of 1 to 1,929. Five were found in a series of 1,831 necropsies at the Huntington Memorial Hospital, an incidence of 1 to 366 necropsies. The ratio for the combined series is 1 case to 1,517 necropsies. Eight clinical cases are reported. In analyzing the 27 unilateral cases the 19 necropsy and 8 clinical cases are considered together. The right and left kidneys were absent with equal frequency. The adrenal gland was present in 17 cases and recorded as absent in none. In 21 cases the ureter and half of the trigone were entirely absent. The solitary kidney was always enlarged unless shrunken by disease. Eleven of the 19 necropsy cases showed congenital defects of the single kidney. In 6 (4 females and 2 males) developmental defects of the genital organs existed. Renal failure was the cause of death in 6 cases. Hypertension had existed in only 3 of the necropsy cases. The study of all kinds of anomalies of the upper urinary tract reveals that there is little hope of distinguishing renal agenesis from renal aplasia clinically with any degree of certainty. Absence of half of the trigone is much more indicative of agenesis than of aplasia. Absence of one ureteral orifice, representation of the orifice by a mere dimple or termination of the ureter just beyond the bladder wall occurs more commonly with renal agenesis than with renal aplasia. However, there are all degrees of ureteral aplasia with renal aplasia.

Management of Uterine Myomas.—According to Phaneuf the treatment of uterine myomas depends on their size, their location in the uterus, their symptomatology and the age of their host. The author reviews the records of 1,000 consecutive cases which he treated. The youngest patient was 20 and the oldest 76 years of age. The incidence of myoma was highest between 30 and 49 years; this observation agrees with other statistics. Women with small myomas which are not productive of symptoms do not require treatment, but they should be kept under observation and examined every six months to a year. Myomectomy, while more difficult of execution than ablation of the uterus, offers a reward in the fact that it prevents castration and also permits many women in the childbearing age, to which it is almost entirely applicable, to gratify their desire for maternity. Even in some who are approaching the menopause, prevention of castration has a salutary influence. For patients to whom myomectomy is not feasible, for those who are the hosts of large tumors and for those who have reached or passed the menopause, hysterectomy has to be considered. A choice must be made from three types of operation—fundic hysterectomy, supracervical or supravaginal hysterectomy and panhysterectomy. The importance of preoperative preparation, of the liberal use of blood and blood plasma transfusions and of postoperative care is stressed. The author reserves radium and x-ray treatment for cases in which surgery is contraindicated because of impaired physical condition and disease of the vital organs, such as the heart, kidneys, liver and lungs, and because of severe hypertension. The mortality in the author's 1,000 cases was 2.8 per cent. No deaths occurred in the last 386 cases. The author prefers surgery to irradiation when the former can be used safely.

Compound Used in Soap to Reduce the Bacterial Flora of Human Skin.—Traub and his collaborators investigated the germicidal action on the skin of hands and forearms of a new synthetic phenol, 2,2'-dihydroxy-3,5,6-3', 5',6'-hexachloro-diphenyl-methane, also designated as "G-11." Preliminary studies were made to determine the effect of G-11 on the growth of certain micro-organisms, the sensitivity of the human skin to it and its effect on the bacterial flora of the hands and forearms. Compound G-11 was found to be nonirritating to the skin as judged by more than two hundred patch tests. These were repeated on the same subjects after ten to fourteen days and were again negative. Subjects using 2 per cent G-11 soap regularly for one year have shown no evidence of irritation. The regular use of toilet soap containing compound G-11 in a concentration of 2 per cent reduces the resident bacterial flora of the skin. A person using this soap regularly has a lower resident count after two minutes of washing than a person who washes for twenty minutes with ordinary toilet soap. Thus the

daily use of a soap containing compound G-11 would enable a surgeon or operating room attendant to maintain an extremely low bacterial population on his skin and might permit shortening the routine preoperative scrub-up procedures and perhaps the elimination of irritating germicides without sacrifice of skin cleanliness. The economy suggested by the omission of the alcohol and iodine rinse may be an important factor, especially now when they are not readily obtainable. Regular use of soap containing compound G-11 should reduce the probability of infection following skin abrasions and superficial wounds. This point might be of value in the hygienic care of members of the armed forces. The authors suggest the use of G-11 also in soap or in other vehicles for protection against skin infections from barber shops or beauty parlors, hair follicle infections from cutting oils and the like.

Texas State Journal of Medicine, Fort Worth

40:43-166 (June) 1944

- Socialized Medicine Shall Not Pass. C. S. Venable.—p. 49.
Progress in Cancer Research: I. Animal Experimentation in Solution of Cancer Problems. W. A. Selle.—p. 52.
Public Health—Past, Present and Future. W. B. Russ.—p. 56.
Medical Education and Postwar World. M. Fishbein.—p. 58.
New Plans Regarding Medical Care for Public. J. T. Richardson.—p. 60.

40:167-216 (July) 1944

- Antibiotics. C. D. Leake.—p. 175.
Clinical Significance of Rh Factor: I. Its Importance in Transfusion Reactions. J. M. Hill and S. Haberman.—p. 177.
Id.: II. Its Importance in Erythroblastosis Fetalis. S. Haberman and J. M. Hill.—p. 182.
*Practical Applications of Rh Factor to Obstetrics. J. J. Andujar.—p. 188.
Sternal Marrow Aspiration as Aid in Diagnosis. R. L. Cope.—p. 191.
Lymphangitis of Mucosa of Paranasal Sinuses. J. M. Robison.—p. 193.
Recent Developments in Problem of Spotted Fevers. L. Anigstein.—p. 199.

Rh Factor in Obstetrics.—According to Andujar, routine Rh typing is as essential in an obstetric service as A and B determination. Ordinary cross matching, even at 37 C., will not always determine Rh incompatibility. Rh—pregnant or recently delivered women and all newborn infants should be given Rh—blood only. In expected or actual erythroblastosis the infant should receive frequent small transfusions of Rh—group O blood. If any transfusion raises the icterus index, causes "pyrogen" reaction or does not raise the hemoglobin level the Rh factor must be considered as a possible etiologic agent. Every institution should keep an up to date list of Rh—universal (group O) donors available for Rh emergencies.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

52:287-324 (July) 1944

- Gonadotropic Hormones with Special Reference to Their Action on Female Reproductive Mechanism. Miriam E. Simpson.—p. 287.
Sterility Problem. W. T. Pommerenke.—p. 295.
Cervical Resection for Treatment of Salpingitis. H. C. Falk.—p. 309.
Menopausal Therapy in Clinic Practice: Comparative Study. F. E. Lane.—p. 313.

52:325-358 (Aug.) 1944

- Micromoving Pictures and Electrocardiographic Records of Age Changes in Embryonic Heart Action. B. M. Patten.—p. 325.
Reasons for Recent Increase of Bronchogenic Carcinoma. W. Boyd.—p. 330.
Conception Control by Plastic Cervix Cap. E. Grafenberg and R. L. Dickenson.—p. 335.
General Indications for Radiation Therapy of Cancer. F. Buchke.—p. 341.
Vitamin Therapy. D. Zimmerman.—p. 352.

Yale Journal of Biology and Medicine, New Haven

16:613-764 (July) 1944

- Historical Note on Concept of Arterial Hypertension. M. Backer.—p. 613.
Suggestion for Production of Therapeutic Fever in General Paresis. L. H. Cohen and Virginia Hale.—p. 619.
Effect of Sex Hormones on Nephrotoxic Nephritis in Rat. P. M. Le Compte.—p. 627.
Bacterial Variation: Influence of Environment on Dissociation Pattern of Klebsiella Pneumoniae. J. C. Humphries.—p. 630.
Niacin in Maize. P. R. Burkholder, Ida McVeigh and Dorothy Moyer.—p. 639.
Studies on Relationship of Dermatomyositis to Ulceration and Gangrene of Extremities. K. W. Thompson.—p. 655.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

28:317-372 (July) 1944

- Lacrimation Reflex. J. R. Mutch.—p. 317.
 *Vitamin P in Ophthalmology. W. R. Mathewson.—p. 336.
 Desiccation Keratitis. J. E. M. Ayoub.—p. 347.
 Secretion-Diffusion Theory of Intraocular Fluid Dynamics. V. E. Kinsey and W. M. Grant.—p. 355.
 Late Results of Removal of Intraocular Foreign Bodies with Magnet. P. D. Trevor-Roper.—p. 361.

Vitamin P in Ophthalmology.—Mathewson used vitamin P with satisfactory results in 2 cases of ocular hemorrhage. The first patient had extensive retinal hemorrhages and nasal and bladder hemorrhages, but on giving vitamin P the nasal and bladder hemorrhages ceased, no fresh retinal hemorrhages occurred, and those present became absorbed. He suffered from myelomas, and the nasal hemorrhage was characterized by large blood clots and serum. The second patient had recurrent hemorrhage into the anterior chamber after extraction of a cataract, but on receiving vitamin P there was no recurrence, and the iris, which had become muddy, rapidly cleared. The eye rapidly took on a healthy tone and the patient improved greatly in general appearance and mental agility. It has been suggested (*Am. J. Ophth.* 21:1058 [Sept.] 1938) that deficiency in vitamin C, with consequent defective lens respiration, may be the real cause of cataract, the whole vitamin C metabolism of the body being deranged in this condition. The record does not show that steps were taken to exclude vitamin P, which is apparently often found along with vitamin C in the various natural sources. The evidence in these 2 cases suggests that vitamin P is of value in ophthalmology.

British Medical Journal, London

1:833-862 (June 24) 1944

- Experimental Study of Different Methods of Artificial Respiration. A. Hemingway and E. Neil.—p. 833.
 Improved Dentition of 5 Year Old London School Children: Comparison Between 1943 and 1929. May Mellanby and Helen Coumoulos.—p. 837.
 *Polio-myelitis in British and American Troops in Middle East: Isolation of Virus from Human Feces. J. R. Paul, W. P. Havens and C. E. Van Rooyen.—p. 841.
 Sympathectomy and Sterility. N. C. Lake.—p. 843.
 Case of March Hemoglobinuria. M. Makin.—p. 844.

Polio-myelitis in Troops in Middle East: Isolation of Virus from Feces.—Paul and his associates state that polio-myelitis among British troops in the Middle East has not been uncommon since 1940. There were severe and many fatal cases. The virus of polio-myelitis has been isolated from the central nervous system in several of the fatal cases. Attempts were made to isolate polio-myelitis virus from the stools of the patients. The tests attempted to determine (1) their value as a confirmatory diagnostic procedure and (2) whether in these adult cases (which have occurred for the most part sporadically) the virus is harbored in the intestinal tract. The authors examined stool specimens from 35 patients and contacts; 17 of these were American and 18 British. There were 15 cases of typical polio-myelitis, 17 atypical cases and 3 contact cases. From the 10 fatal cases of polio-myelitis the isolation of virus from stools was accomplished in 9 instances. Negative findings have been encountered in the remaining 5 nonfatal cases and in 20 "atypical" cases and contacts. Of the latter 5 were cases of polio-encephalitis, 6 of "acute benign lymphocytic meningitis," 6 of meningitis and 3 polio-myelitis contacts. The negative virus findings do not wholly exclude the possibility of polio-myelitis. These results suggest that the amount of virus present in the intestinal tract was greater in the more severe than in the milder cases, an observation which has not received comment before, and one which may not hold true for juvenile cases. The high percentage of positive results from the fatal cases was probably due to the fact that most of the stools were collected earlier in the disease than in the other polio-myelitis cases. The chances of obtaining positive results are greater during the first than during the later weeks of the disease.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

51:181-276 (June) 1944

- *Effect of Posterior Lobe Pituitary Gland Fractions on Intact Human Uterus. C. Moir.—p. 181.
 Anemias of Pregnancy: Report on Hematologic Study of 48 Cases of Pregnancy with Review of Literature. G. A. Elliott.—p. 198.
 Hämam Ovum Nine to Ten Days Old. F. Davies and H. E. Harding.—p. 225.
 Leukemia and Pregnancy. A. Hochman.—p. 231.
 Consideration of White Paper "A National Health Service" in so far as It Affects Maternity and Child Welfare Services. D. Baird.—p. 240.
 Oxytocic Drugs and Their Use. C. Moir.—p. 247.

Effect of Posterior Pituitary Fractions on Human Uterus.—Moir points out that, of the two active principles obtainable from the extract of the posterior lobe of the pituitary, one has the property of stimulating the plain muscle of the arteries and certain abdominal viscera; the other is exclusively concerned with the stimulation of the plain muscle of the uterus. It is still a moot point whether these principles exist in the body as separate entities or whether they become these as the result of manipulation of the extract. The vasopressor and oxytocic fractions are sometimes referred to as pitressin and pitocin or as vasopressin and oxytocin. In pitocin and pitressin a substantial separation of the two principles has been effected, but the differentiation is not complete and each contains approximately 10 per cent of the other reckoned in units of respective activity. The author found that the muscular activity of the human uterus varies according to the physiologic state of the organ. In the case of the nonpregnant uterus this is true also with regard to the phase of the menstrual cycle. The response of the uterus to posterior pituitary injection also varies according to the physiologic state of the uterus at the time of the test. Contrary to Knaus's observations, it was found that the nonpregnant uterus responds to posterior pituitary injection at every phase of the menstrual cycle, although response is most powerful immediately before, during or soon after menstruation. The response to posterior pituitary injection during early pregnancy is weak, but it becomes strong if the uterus is already actively aborting its contents. Given in the usual clinical dosage the vasopressor fraction is sometimes a powerful stimulant of the uterus. Conversely, the oxytocic fraction is sometimes without action. The nature of the response to these fractions is governed by the physiologic state of the uterus at the time of the test. The response to posterior pituitary injection by an isolated muscle strip suspended in a saline bath does not necessarily reflect the behavior of the intact uterus to these substances. In particular, an isolated strip of human uterus at term reacts in a substantially different manner toward pitocin and pitressin than does the intact human uterus. The cause of the anomalous behavior is unknown.

Lancet, London

1:777-808 (June 17) 1944

- Substances Chemotherapeutically Active Against Typhus Rickettsiae. C. H. Andrewes, H. King, M. van den Ende and J. Walker.—p. 777.
 Wounds of Neck and Larynx. R. S. Lewis.—p. 781.
 *Comparative Effects of Sulfonamide Drugs in Mild Bacillary Dysentery. J. G. Scadding.—p. 784.
 Treatment of Fractures of Femoral and Tibial Shafts in Same Limb. V. H. Ellis, H. H. Langston and J. S. Ellis.—p. 786.
 Further Observations on Use of Cetavlon in Surgery. R. E. O. Williams, Barbara Clayton-Cooper, H. C. Faulkner and H. E. Thomas.—p. 787.
 Blast Injury: Nonfatal Case with Neurologic Signs. O. Garai.—p. 788.
 Dislocation of Sesamoid of Hallux. G. M. Muller.—p. 789.
 Abscess in Thyroid Gland: Report of 2 Cases. F. E. Stock.—p. 789.

Comparative Effects of Sulfonamides in Mild Bacillary Dysentery.—Scadding records observations during the summer of 1943 at a large desert base hospital on the relative efficacy of sulfaguanidine, sulfapyridine and sulfanilamide. Sulfanilamide in heavy doses for forty-eight hours was tried as a routine treatment with results that seemed comparable with those previously obtained with sulfaguanidine. Observations in 358 cases of mild bacillary dysentery demonstrated that sulfanilamide, sulfapyridine and sulfaguanidine in adequate doses are equally beneficial. The only advantage of sulfaguanidine, which has made it the drug of choice, is that it hardly ever has unpleasant side effects. The grave defect of sulfapyridine is its liability to cause serious renal disorders, a special danger in a dehydrating disease, though with adequate

care about water intake this danger should be avoidable. A lesser defect is that it is apt to cause nausea and vomiting. Sulfanilamide in this series had no serious side effects, and its therapeutic possibilities in bacillary dysentery seem to have been unduly neglected.

1:809-840 (June 24) 1944

- Epidemiology of Wound Infection. A. A. Miles.—p. 809.
*Hepatitis Following Injection of Mumps Convalescent Plasma: I. Use of Plasma in Mumps Epidemic. P. B. Beeson, G. Chesney and A. M. McFarlan.—p. 814.
*Id.: II. Epidemiology of Hepatitis. A. M. McFarlan and G. Chesney.—p. 816.
*Id.: III. Clinical and Laboratory Study, with Liver Biopsy Studies. W. L. Hawley, A. M. McFarlan, A. J. Steigman, J. McMichael and J. H. Dible.—p. 818.
Impaction of Prostatic Stone in Urethral Stricture. J. B. Kinmonth and J. L. Pinniger.—p. 821.
Pentothal Sodium in North Africa: 2,500 Administrations at Base Hospital. E. S. Curliiss.—p. 822.
Gunshot Wound of Colon: Recovery Without Immediate Operation. W. W. Wilson.—p. 824.

Plasma in Mumps Epidemic: Hepatitis Following Its Injection.—Beeson and his associates made an attempt to control an epidemic of mumps by passive immunization of susceptible persons. The camp in which their studies were made had a permanent military staff of 500, few of whom had mumps. The epidemic concerned 900 volunteers in training who made up a "young soldiers" regiment and whose average age was 19. New trainees arrived in groups of 70 to 80 each fortnight. Each new group of arrivals was designated as a "troop." The January peak of cases of mumps was due largely to troop 19 (arrived December 11). A member of this troop developed mumps on Dec. 16 and must have been infected before arrival. For the first lot of convalescent plasma (A) 11 convalescents were bled an average of 450 cc. each. All plasma was pooled. For the second lot of plasma (B) 11 other mumps convalescents were bled. The inoculations were given by vein, the A plasma in doses of 4, 5 or 6 cc. to 266 susceptible volunteers at the camp on March 12, and the B plasma in doses of 8 cc. on March 28 to 204 men who had already received the A plasma. There were no reactions. The epidemic was not immediately cut short but declined rapidly. Its decline may have been due to causes other than passive immunization. Cases occurred in inoculated men in the period when they should have been protected, and attack rates on the inoculated men and a control group were not significantly different. Hepatitis developed in 44.7 per cent of the men inoculated. This unfortunate sequel should not of itself condemn the use of passive immunization in the control of epidemics of mumps.

Epidemiology of Hepatitis Following Injection of Mumps Convalescent Plasma.—McFarlan and Chesney state that when 20 cases of jaundice developed among the men who had received mumps convalescent plasma a field survey was made of all the men in training at the camp. Hepatitis developed in 101 of 266 men inoculated with mumps convalescent plasma. In the great majority the onset was between fifty-nine and ninety-four days after inoculation. The authors think it unlikely that syringe transmission was the cause of this outbreak. There was no aggregation of cases in the men of any one troop, such as would have indicated that an agent had been introduced from one recipient and diluted out as the inoculations proceeded. All the 11 donors of the A lot of plasma, which apparently contained the hepatotoxic agent, were questioned. None had ever had jaundice. There was no reason to suppose that the agent was introduced during the processing of the plasma. Two observations indicated that the hepatotoxic agent was probably not the virus of infective hepatitis: First, the interval between the inoculation and the development of symptoms was fifty-nine to ninety-four days in the vast majority of cases, whereas the incubation period of infective hepatitis is from twenty-one to thirty-five days. Second, an attack of infective hepatitis usually confers immunity, but of 11 inoculated men who had had jaundice in childhood 8 developed hepatitis in this outbreak. The incidence in them was higher than the incidence in inoculated men who had not previously had jaundice. The infectivity of cases

of plasma hepatitis was low. A few of the uninoculated men might have been infected by inoculated men who developed hepatitis a month previously, but none of them admitted close contact with a possible infecting case. The most probable explanation of the cases in uninoculated men seemed to be that they were sporadic cases of infective hepatitis. Two late cases in uninoculated men might possibly have been infected by inoculated men who had developed hepatitis at least fifty-seven or forty-nine days previously.

Study of Hepatitis Following Injection of Mumps Convalescent Plasma.—Hawley and his associates made clinical and laboratory observations on 47 patients at the American Red Cross Harvard hospital and on 23 patients never requiring medical attention discovered during a survey of the camp; data were also obtained on 16 more patients who had been admitted to other hospitals before the study was contemplated. The hepatitis was mild and, except for the common skin manifestations and arthralgias, resembled epidemic infective hepatitis as seen among children and young adults in Britain. On the basis of nausea, lassitude, fever and depth of coloration 40 cases were classed as mild, 6 as moderately severe and 1 as severe. The severely involved patient remained in the hospital forty-five days. For comparison with the plasma inoculation hepatitis a table gives the findings in 39 patients with infective hepatitis admitted to the same hospital in 1941-1942. The two groups were fairly similar. The patients with hepatitis from convalescent mumps plasma showed a greater lag in reporting ill, a lower incidence of vomiting and a higher incidence of severe arthralgias and rashes. Laboratory studies which included white cell counts, blood bilirubin determinations and examinations to exclude bacterial infections, Weil's disease and infectious mononucleosis furnished no evidence of a known etiologic agent. Routine cultures of feces, blood and the throat were negative for pathogenic bacteria. Serum agglutinins for *Leptospira icterohaemorrhagiae* and *Leptospira canicola* were absent in 23 persons tested. Heterophil agglutinins (Paul-Bunnell test) were present in only 1 of 38 persons tested in titers above 1:14. This case was diagnosed as infectious mononucleosis. Routine urine examination showed biliruria in all hospital cases. Erythrocyte sedimentation rate was raised in 23 of 39 cases. The leukocyte counts revealed no appreciable differences in the two groups. Liver biopsy material was obtained from 5 patients. The histologic sections in all cases showed varying degrees of hepatitis.

2:1-32 (July 1) 1944

- Teaching and Practice in Preventive Medicine. J. M. McKintosh.—p. 1.
Retropitoneal Gas. G. E. Parker.—p. 5.
*Prevention of Jaundice Resulting from Antisiphilitic Treatment. M. H. Salaman, A. J. King, D. I. Williams, C. S. Nicol.—p. 7.
*Epidemiology of Infective Hepatitis. J. H. L. Sheehan.—p. 8.
Evacuation of Fractured Femur: Tobruk Plaster and Other Methods Used in Middle East. E. A. Jack.—p. 11.

Prevention of Jaundice Resulting from Antisiphilitic Treatment.—Salaman and his associates investigated the hypothesis that jaundice is spread by syringes. A technic of intravenous injection was devised which would exclude the possibility of cross infection. In 67 men treated by the ordinary technic for 120 days the incidence of jaundice was 37 per cent, and in 56 of those treated for 180 days it was 68 per cent. Of 36 men treated by the new technic for 120 days only 1 developed jaundice. Similarly of 18 treated for 180 days only 1 was affected. These results strongly suggest that a causative agent of postarsenical jaundice can be transferred by improperly sterilized syringes and that this transference can be prevented by attention to the technic of injection. It is not implied that infection transferred in this way is the sole cause of the condition; arsenic, or deficiencies of SH (sulfhydryl) containing amino acids in a wartime diet, may still be predisposing factors. Boiling syringes will not necessarily suffice without other precautions. In a busy clinic there are other possibilities of transference of infection against which their technic was designed to guard. Syringes which have been boiled in tap water have to be rinsed in distilled water before use. The gallipot in which the drug is dissolved stands on the bench for long periods and is used over and

over again; the lip of the bottle of sterile water from which it is filled is likely to become contaminated. All these manipulations have to be carried out by attendants who are handling patients and blood stained syringes. There is danger of transference of infection in the course of this procedure even if the syringes are boiled between injections. A closed method obviates these dangers and, once it is organized, is considerably easier and quicker in use than the old open method. There will be occasional cases of jaundice even if the best regulated technic is followed. Some cases of the epidemic type are always likely to occur; moreover the possibility cannot be excluded that arsenic may activate an otherwise healthy carrier.

Epidemiology of Infective Hepatitis.—According to Sheehan it appears fairly clear that jaundice following the injection of neoarsphenamine is not due to the arsenical treatment but is purely due to the transmission of minute quantities of infected blood by unsterilized syringes. The only part played by the neoarsphenamine seems to be that it produces some impairment of liver function in a patient who already has an active hepatitis. The author reviews observations on several groups of syphilitic patients which indicate that sterilized syringes and proper precaution against other contaminations with blood will prevent the development of jaundice which has been observed in high percentages of patients when syringes were merely washed and not sterilized. Further evidence that the neoarsphenamine is not the significant factor comes from the incidence of hepatitis in personnel handling the blood of syphilitic patients in a clinic where many of these patients were incubating hepatitis. Of 85 cases of hepatitis occurring in a sanatorium, the records of 56 were studied in detail. A certain number had been given calcium or gold preparations intravenously, but half of those who developed hepatitis had had no therapy of this kind. None of the patients were given neoarsphenamine, so that this factor can be excluded. The common factor was that every patient had had blood taken from an arm vein for sedimentation rate estimation on admission to the sanatorium and at monthly intervals thereafter. The syringes used for these blood collections were well washed out but not sterilized between 1 patient and the next. The cases of jaundice tended to occur in a ward at monthly intervals corresponding to the monthly intervals between the collection of blood samples. Hepatitis following the administration of neoarsphenamine and that resulting from unsterile syringes used for merely collecting blood appear to be identical with an incubation period of about three months. This is a similar incubation period to that seen in homologous serum jaundice. It is suggested that infective hepatitis in England and in the army in the Mediterranean theater is also the same type of disease and that it could well be transmitted by biting insects.

Schweizerische medizinische Wochenschrift, Basel

73:1149-1220 (Sept. 24) 1943. Partial Index

- Cushing's Disease. W. Berblinger.—p. 1159.
 *Thyroid Cirrhosis of Liver. G. Bickel.—p. 1160.
 Adrenal Cortex and Thyroid. F. Verzar.—p. 1163.
 Intradrural Cervical Division of Spinal Posterior Roots in Spasmodic Torticollis. C. Henschen and L. Jeker.—p. 1166.
 Neurofibromatosis in Children. M. Péhu.—p. 1173.
 Presumptive Importance of Combination of Sugars and Phosphates with Vitamins. E. Bürgi.—p. 1176.
 Attack of Gout, an Allergic Phenomenon. W. Löffler.—p. 1179.
 Telangiectatic Growths of Skin and Diseases of Liver. A. Schüpbach.—p. 1186.
 Origin of Hyperproteinemia. C. Wegelin.—p. 1189.
 Results of Experimental Study on Animals with Carbonyl Chloride and Dichlorodiethylsulfide Poisoning. E. Rothlin.—p. 1205.

Thyroid Cirrhosis of Liver.—Bickel demonstrated moderate enlargement of the liver in 20 out of 50 patients with hyperthyroidism. The liver edge was smooth, hard and tender. Myocardial insufficiency was present in two thirds of the cases with hyperthyroidism and enlarged liver, while one third did not have any signs of insufficiency. Treatment of hyperthyroidism caused disappearance of liver tenderness and enlargement. These are not instances of a latent cardiac enlargement but of an active hyperemia. Lesions of the hepatic parenchyma in the course of a thyrotoxicosis are manifested

by a high incidence of functional changes, by icterus of various severity and frequently by a chronic and prolonged course. The stage of hypertrophy of the liver passes into one of cirrhosis, which is often masked by the more evident symptoms of hyperthyroidism and particularly by cardiac insufficiency. The course of this thyroigenous cirrhosis may be a slow one and it may be years before it becomes clinically manifest. Cardiac insufficiency may play a more prominent role in the symptomatology, but the hepatic disorder influences the clinical picture.

Archivos Argentinos de Pediatría, Buenos Aires

15:385-484 (May) 1944. Partial Index

- *Ganglioneuroma of Thorax and Abdomen: Two Cases. G. Allende, A. A. Ferraris and C. C. Lugones.—p. 385.
 Spontaneous Valvular Pyopneumothorax in Children: Cases. J. M. Pelliza.—p. 420.

Ganglioneuroma.—According to Allende and his collaborators ganglioneuroma of either the abdomen or the thorax is rare in children. The prognosis is favorable if the tumor is removed. They report 2 cases in children of 3 and 9 years respectively. The tumor was located on the left paravertebral region of the abdomen in the first case and on the same side of the thorax in the second case. An erroneous clinical and x-ray diagnosis of sarcoma of the kidney in the first case and of a hydatid cyst of the lung was made. The patients recovered after surgical removal of the tumor, which on microscopic examination proved to be ganglioneuroma. The tumor is made up of differentiated ganglion cells. It may contain either juvenile or embryonal cells, which first are grouped in areas and later assume malignant characteristics. The advisability of an early operation is obvious.

Revista Médica de Rosario, Rosario

34:401-504 (May) 1944. Partial Index

- Roentgen Therapy in Schüller-Christian's Syndrome. F. P. Cifarelli and A. A. Pujadas.—p. 401.
 Potassium Thiocyanate in Arterial Hypertension. J. M. González and J. Dornier Muñoz.—p. 424.
 *Syndrome of Renal Anaphylaxis. J. S. Dotta and T. Delporte.—p. 436.

Renal Anaphylaxis.—The subject of Dotta and Delporte's report was given a small dose of sulfanilamide, to which he reacted with anuria and urticaria. The urine (after thirty-six hours of anuria) contained a large amount of hyaline casts but neither blood nor sulfanilamide crystals. The patient had a subcutaneous abscess, which was open late during convalescence. Ten days after he had been discharged from the hospital a new urticarial reaction occurred. This time diuresis was normal. It was found that sulfanilamide powder was applied for the first time to the healing abscess the day on which urticaria reappeared. The authors believe that this case is one of renal anaphylaxis of the Tzank type. This is the first case in the literature in which this form of anaphylaxis was caused by sulfanilamide.

Semana Médica, Buenos Aires

51:1165-1216 (June 8) 1944. Partial Index

- Purulent Pleurisy in Children. J. M. Pelliza.—p. 1171.
 Mucocutaneous Colitis. L. Herraiz Balletero.—p. 1179.
 *Fulminant Hemoptysis in Bronchopulmonary Cancer. C. A. Crivellari and D. G. Giordano.—p. 1185.

Fulminant Hemoptysis in Bronchopulmonary Cancer.—According to Crivellari and Giordano fulminant hemoptysis without pulmonary tuberculosis is rare. The authors' patient was a man aged 49 who was normal up to seven months before consultation. The disease began with general debility, cough and occasional small hemoptysis. A tumor appeared at a later date in the right supraclavicular fossa. There were progressive cachexia, loss of voice and dysphagia. Tubercle bacilli were not demonstrated. A clinical and roentgen diagnosis of bronchopulmonary cancer was made. The patient had an acute hemoptysis on the tenth day of hospitalization and died immediately. Necropsy showed bronchopulmonary cancer with metastases to the lungs, paratracheal, intertracheobronchial and hilar lymph nodes, thyroid, liver, adrenals and kidneys.

Book Notices

War Neuroses in North Africa: The Tunisian Campaign (January-May 1943). By Lt. Colonel Roy R. Grinker, M. C., Army Air Forces, and Captain John P. Spiegel, M. C., Army Air Forces. Prepared and Distributed for the Air Surgeon, Army Air Forces, by the Josiah Macy Jr. Foundation. Paper. Pp. 300. New York, 1943.

This preliminary report of the neuropsychiatric casualties encountered during the Tunisian campaign was reproduced and distributed through aid from the Josiah Macy Jr. Foundation. It was written in the theater of operations. In the foreword this fact is given in explanation of the obvious need for careful editing which exists throughout the work.

The material is made up primarily of actual battle casualties which occurred during the difficult campaigns of this period. The authors were stationed from 300 to 500 miles behind the front lines and from 150 to 200 miles behind the active air bases. Patients when evacuated by air arrived for treatment in from two to five days after the breakdown, and others arrived from seven to ten days after the clinical onset. The authors set up a classification scheme of ten clinical syndromes manifested by specific symptoms depending on the manner in which the individual handles the anxiety engendered by his situation. These syndromes are described as "free-floating anxiety, severe and mild," "somatic regression," "psychosomatic visceral disturbances," "conversion symptoms," "depression," "neuroses complicating cerebral concussion," "exhaustion states," "fatigue," "psychozes," and "malingering." Each of these groups is described in some detail and is amply illustrated by case histories. The case histories are interesting and excellently done. One sometimes wishes, however, that the authors had been more complete in their discussion of the conclusion of the case, so that the reader might be more clear concerning the treatment procedures and the outcome. Particularly emphasized is the process of narcosynthesis, which is described as a new type of treatment. It is in essence a new name for a treatment which had been used in a number of psychiatric clinics before the war. This treatment involves the use of short acting barbiturates (sodium pentothal) during which the patient is stimulated to relieve his traumatic experience. Some suggestions are made which could well be utilized, however, by civilian psychiatric clinics. Psychotherapy, convulsive shock therapy, continuous sleep treatment, general convalescent care, occupational therapy, group therapy and less discussed methods of treatment are described. The authors give a table and make a general statement concerning the number of patients treated. This is broken down into the number returned to active duty and of those evacuated to the United States and the United Kingdom. This gives the reader a good general overall picture of the value of the treatments utilized but does not answer the question of results in specific cases described in the report. In general the book is very well done, certainly worth while, and has made a genuine contribution to psychiatric war literature. It contains much of value for all psychiatrists, military or otherwise.

Medical Diagnosis: Applied Physical Diagnosis. Edited by Roscoe L. Pullen, A.B., M.D., Instructor in Medicine, Tulane University of Louisiana School of Medicine, New Orleans. With a foreword by John H. Musser, B.S., M.D., F.A.C.P., Professor of Medicine, Tulane University of Louisiana School of Medicine. Cloth. Price, \$10. Pp. 1,106, with 566 illustrations. Philadelphia & London: W. B. Saunders Company, 1941.

According to the editor, Medical Diagnosis emphasizes the methods utilized in the determination of expressions of disease states; these include the history, physical examination and various accessory procedures in the form of endoscopic, roentgenographic and microscopic studies. To accomplish this heroic task 1,042 pages are required. It is evident, therefore, that a thorough inquiry into the subject of medical diagnosis as defined cannot possibly be accomplished between the covers of this book. By and large what is presented is done so in an admirable fashion and will be a real aid to the practicing physician. Worthy of particular mention are the chapters on oral diagnosis, examination of the breast, examination of the chest, examination of the heart, the neurologic examination, and the chapter on determination of prognosis. The electrocardiographic diagnosis is worthy of particular praise, but the reviewer

wonders how well it will be appreciated by the student of physical diagnosis and one wonders why 58 pages are devoted to this aspect of cardiac diagnosis and only some 8 pages to roentgenologic examination; certainly the two are of at least equal value in the diagnosis of heart disease.

It is surprising to find that the various diagnostic procedures indicated in the study of gastrointestinal disease are almost completely ignored, while a total of 39 pages is devoted to urologic diagnosis. The rather important diagnostic value of allergic surveys and of hematologic and feces examinations is not mentioned, while some 10 pages are devoted to a sterility survey and 4 to clinical electroencephalography. The differential diagnosis of coma, which is a problem even for the seasoned clinician, is accomplished in 13 pages. The reviewer feels that this book, although far beyond the grasp of the medical student studying physical diagnosis, will prove of interest to practicing physicians.

A Century of Butler Hospital, 1844-1944. Paper. Pp. 49, with 10 illustrations. Providence, Rhode Island, 1944.

The present volume, written in commemoration of a century of service, is a history of the Butler Hospital, Providence, R. I., from the time of its establishment in 1844. The history is written in three parts dealing with the physical and administrative development, the medical service from 1844 to 1922 and the hospital work under the present medical superintendent. The first section gives an excellent description of the founding of the hospital, its early growth and development, the problems of construction, finance and administration, expansion of services, community interests, humanitarian motives, the loyalty and devotion of administrative and hospital personnel and their constant efforts to enhance the quality of institutional care. Professional service is emphasized in the second part, which describes the work and contribution of the medical superintendents who served Butler Hospital prior to 1922. The final chapter reflects the progress of psychiatric service in the last two decades and gives a clear indication of the role of the modern psychiatric hospital in the expanding fields of mental hygiene, individual health and community health. This volume will be of interest not only to the immediate friends of the institution but to all who are concerned in the problems of psychiatric care.

Experimental Basis for Neurotic Behavior: Origin and Development of Artificially Produced Disturbances of Behavior in Dogs. By W. Horsley Gantt, M.D., Associate in Psychiatry and Head of the Pavlovian Laboratory, Johns Hopkins University, Baltimore. Psychosomatic Medicine Monographs, Volume III, Nos. III and IV. Published with the Sponsorship of the American Society for Research in Psychosomatic Problems. Cloth. Price, \$4.50. Pp. 209, with 52 illustrations. New York & London: Paul B. Hoeber, Inc., 1914.

This monograph is a detailed report of prolonged experiments and observations (in the case of 1 dog twelve years) on some 4 dogs in which disturbance of behavior or neurosis was induced by the conflict and strain method of Pavlov. The report is factual, clear and remarkably free from premature generalizations. The author, a pupil of Pavlov, finds striking and consistent individual variations in the case of induction, in the extent and in the persistence of the experimentally induced neurosis, including unusual or pathologic sex behavior (erection) in dogs. That the latter should appear under intense or general stimulation of the involuntary nervous system is not surprising, for it has been shown that intense hunger and thirst may induce cooing even in decerebrated pigeons. Experimental neurosis has now been reported in dogs, rats, sheep, hogs and cats. The significant difference in nervous stability of individual dogs will provide useful material for objective and controlled investigation of the complex hereditary factors in nervous instability.

The Analysis and Interpretation of Symptoms. Edited by Cyril M. MacBryde, M.D. [Reprinted from Clinics, Vol. II, No. 6, April 1941.] Fabrikoid. Price, \$1. Pp. 1343-1644, with illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1941.

This book consists of ten articles by ten different authors and an introduction by Dr. MacBryde. The subjects discussed are thoracic pain, cough, abdominal pain, hematemesis and melena, jaundice, joint pains and obesity. From the title of the book one would expect to find a far greater discussion of the underlying causes of the symptoms, such as physiologic and

pathologic data, rather than an outline of simple differential diagnosis. Not that as far as the latter is concerned it has not served its purpose, but so far as strict analysis is concerned it could be improved on in some places. The most important articles are the ones on headaches, mechanisms and differential diagnosis by Harold G. Wolff, abdominal pain by Sara M. Jordan, hematemeses and melena by Leon Schiff, and obesity by Cyril M. MacBryde. Some of the others are fairly good and some are mediocre. It would not be fair to criticize the ability or knowledge of any of the authors, but it is certainly fair to point out the defect of trying to cover too much ground in a limited space. It would be far better to emphasize the commonest cause producing symptoms and indicate them as such than to try to spread oneself over everything pertaining to the subject. The printing is excellent and the index fairly complete.

Health and Medical Care, Washington County, New York. A Study of Resources and Needs for Health and Medical Care in Washington County, New York. Study made by New York State Health Preparedness Commission in Cooperation with Washington County Health Preparedness Committee. Walter S. Bennett, M.D., Chairman. Paper. Pp. 41, with illustrations. New York, 1941.

Health and Medical Care, Ontario County, New York. Resources and Needs for Health and Medical Care in Ontario County, New York. Study made by New York State Health Preparedness Commission in Cooperation with Ontario County Health Preparedness Committee. James S. Allen, M.D., Chairman. Paper. Pp. 48, with illustrations. New York, 1941.

Health and Medical Care, Seneca County, New York. Resources and Needs for Health and Medical Care in Seneca County, New York. Study made by New York State Health Preparedness Commission in Cooperation with Seneca County Health Preparedness Committee. Walter Pamphilon, M.D., Chairman. Paper. Pp. 42, with illustrations. New York, 1941.

These surveys, made by the New York State Health Preparedness Commission, cover three rural and semirural counties. Two (Seneca and Ontario) are in the Finger Lake District, and one (Washington) is on the boundary with Vermont. Much the same picture appears in all three. Allowing for the war arrangements there are adequate physicians but insufficient dentists to provide proper dental care and a pressing shortage of nurses. Where there is a local lack of hospital facilities there are usually additional facilities in nearby counties that can be used.

The indigent are cared for by county arrangements with physicians. Nearly all have some hospital insurance and industrial plans with a variety of coverage, and all consider expenditures for public health too small to provide needed services. The percentage of vaccinations is below the level of the rest of the state and in all three counties immunization for diphtheria is decidedly deficient. School examinations and treatment of defects found are somewhat inadequate but improving. There is a general lack of adequate laboratory services.

The population of these counties contains a larger percentage of persons in the older age groups than the rest of the state. Everywhere there is complaint of a lack of facilities for the chronically ill. The suggestions offered include the development of medical care plans for the indigent, better health education and further study of the localities. Nearly all of the conditions described are highly typical of probably a majority of the counties in the United States not including large cities. The same sort of survey might well be made in other counties as a guide to medical planning.

Electronics; Today and Tomorrow. By John Mills. Cloth. Price, \$2.25. Pp. 178, with illustrations. New York: D. Van Nostrand Company, Inc., 1944.

This is a singularly fine example of popular scientific writing. The nature and properties of the electron are explained, starting from first principles. Electronic phenomena in nature are described with lucidity. The basic experimental studies and types of apparatus underlying the science and applied art of electronics are explained in sequence of development. Finally the means are described through which electronics has grown into the practical arts of television, electron microscopy, communications and control of process and power, and finally of transmutation of matter and energy. The author is experienced both in the science of electronics and in its exposition to lay readers. The volume is a fascinating introduction to a field the applications of which in war and in peace are numerous and superlatively important.

Your Eyes. By Sidney A. Fox, A.B., Sc.M. (Ophth.), M.D., Instructor in Ophthalmology, New York University College of Medicine. Cloth. Price, \$2.75. Pp. 191, with illustrations. New York: Alfred A. Knopf, 1944.

The author has attempted to give in simple language, for the benefit of the layman, a brief description of the eyes and how they function. He discusses the refractive errors and shows how glasses improve vision, clarifies the "bogy man" astigmatism and explains why far sighted persons cannot read without glasses after "old sight" develops. His discussion of color blindness, eye muscles and illumination and his chapter on the eyes in traffic explain why not only vision but good fields, dark adaptation and night vision are important. He attempts to clarify the terms and explain the difference between ophthalmologist, optician and optometrist. The chapter on quacks and panaceas should be given wide publicity. The author explodes for the layman the use of eyedrops to cleanse the eyes or to make them feel better. The chapter on "Young Eyes" stresses the need of an early check on vision and especially the need for early treatment of cross eyes. In the final chapter he discusses chiefly cataracts and glaucoma and devotes much space to the latter. On the whole, the book will serve a useful purpose in acquainting the public with information about the eyes and the need for proper care.

Intracranial Arterial Aneurysms. By Walter E. Dandy, Adjunct Professor of Surgery in The Johns Hopkins University, Baltimore. Cloth. Price, \$2.50. Pp. 147, with 55 illustrations. Ithaca, N. Y.: Comstock Publishing Company, Inc., 1944.

In this monograph Dr. Dandy presents his surgical experience with 64 intracranial aneurysms and a study of the records in 44 other cases in which the lesions were disclosed at necropsy. The pertinent data in 108 cases are presented in the detailed charts appended at the back of the book. The symptomatology, diagnostic details and surgical procedures are clearly and concisely discussed. Each significant point is beautifully and profusely illustrated. The press work is excellent and the publisher is to be congratulated on so splendid a monograph at such a small cost. Every one interested in the diagnosis and treatment of intracranial disease will wish to avail himself of this book. One word of caution: this is not a complete presentation of the subject of intracranial aneurysms. The monograph is written from the surgical point of view. The many patients who develop symptoms either of spontaneous subarachnoid hemorrhage or of local pressure as the result of one of these aneurysms and then recover without surgical intervention have not been presented.

The Neurosurgical Patient: His Problems of Diagnosis and Care. By Carl W. Rand, Clinical Professor of Neurological Surgery, University of Southern California School of Medicine, Los Angeles, California. Cloth. Price, \$4. Pp. 576, with 121 illustrations. Springfield, Illinois & Baltimore: Charles C Thomas, 1944.

This is an interesting presentation of neurologic surgery by one of the foremost neurologic surgeons of the Pacific Coast. It has been prepared for students and is in the form of clinic or classroom presentations. It is largely an expression of the personal views and experiences of Dr. Rand rather than a survey of the various opinions held by the neurosurgical profession. Students and practitioners alike will find this a valuable book in which a sound conservative point of view is presented. Dr. Rand's neurosurgical colleagues will welcome this opportunity to share in his views and experience.

Toxicity and Potential Dangers of Penta-Erythritol-Tetranitrate (PETN). By W. F. von Oettingen, Principal Industrial Toxicologist, and others. From the Industrial Hygiene Research Laboratory, National Institute of Health. Prepared by direction of the Surgeon General, Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 282. Paper. Price, 10 cents. Pp. 39, with 9 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1944.

These statements, originally made as confidential reports to the Ordnance Department of the U. S. Army, are now issued for general information. It is concluded that penta-erythritol-tetranitrate, otherwise known as penthrite, is relatively nontoxic. Nitrite effects are produced by large doses, but unusual exposure can be readily controlled by ordinary good housekeeping and personal hygiene. The pamphlet contains much useful information about the chemistry and toxicology of the aliphatic nitrate esters.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TESTOSTERONE PROPIONATE FOR ANGINA PECTORIS

To the Editor:—I am interested in testosterone propionate for its effect on angina pectoris. There was an article in *The Journal* not long ago that discussed this treatment, but I should like to have further information regarding not only its effectiveness but also its contraindications more specifically than was given in the article. Information as to its beneficial effects on senility would be welcome, of course, but the thing that I am particularly interested in would be the possibility of dilatation of the coronary vessels and their increased supply of blood to the heart. What would be the effect of the use of this hormone on becoming easily fatigued and on insomnia?

Charles J. Adams, M.D., Kokomo, Ind.

ANSWER.—The consensus of recent clinical reports seems to be that sex hormone therapy exerts a favorable effect on symptoms if not on the course of angina pectoris. Thus, Strong and Wallace (*Canad. M. A. J.* 50:30 [Jan.] 1944) report great improvement in 6, slight to moderate improvement in 11 and no effect on 3 patients with angina pectoris. Walker (*J. Clin. Endocrinol.* 2:9 [Sept.] 1942) noted definite improvement in 7 of 9 patients with coronary disease when treated with testosterone propionate. The response was manifested by an increase in tolerance to all precipitating factors, an increase in strength and in some cases considerable decrease in the severity of pain when attacks occurred. Sigler and Tulgan (*New York State J. Med.* 43:1424 [Aug. 1] 1943) report symptomatic relief in 11, less pronounced relief in 5 and no relief in 4. Lesser (*New England J. Med.* 228:185 [Feb. 11] 1943), in reporting the results of treating 46 patients with angina pectoris, states that no untoward effects from the use of testosterone propionate were noted and that its beneficial effects continued from two to twelve months after treatment was withdrawn. In the majority of cases there was a lowering of blood pressure levels during the therapy. All his patients showed improvement. Four were studied by means of the exercise tolerance test before and during the course of therapy to obtain quantitative measurements of improvement. In each the amount of exercise tolerated before the development of anginal attack was increased under testosterone therapy, and the severity of the attacks, as measured by the duration of pain, was correspondingly diminished. When sesame was substituted for testosterone these results could not be duplicated. Hamm (*J. Clin. Endocrinol.* 2:325 [May] 1942) did not note unfavorable effects from sex hormone therapy. Average dosage consisted of thirty injections of 25 mg. doses of testosterone propionate in twelve months. There was a general improvement in mental and physical endurance and relief from angina pectoris in all of his 7 patients. This symptom free state lasted for six months in some cases and for eleven and a half months in others. Bonnell and his co-workers (*Ohio State M. J.* 37:554 [June] 1941) recorded clinical improvement in 22 of 23 patients. They believe that the improvement is due to a vasodilating property of sex hormones acting on the coronary circulation. They review the experimental evidence that estrogens and androgens in some manner cause vasodilatation. Thus there seems to be a unanimity of opinion as to the beneficial effects on the subjective symptoms of coronary disease. Although it is difficult to eliminate the psychic effect of the treatment, it would appear that the pharmacodynamic effect of the sex hormone cannot be ruled out. The only dissenting report is that of Levine and Likoff (*New England J. Med.* 229:770 [Nov. 18] 1943). Of 18 patients treated by them 5 showed improvement, 11 were not improved and 2 were only questionably improved. These authors were unable to conclude that testosterone propionate had any beneficial effect.

CARE OF PATIENTS AFTER REMOVAL OF CATARACTS

To the Editor:—What is the accepted postoperative treatment of cataracts, particularly the nursing care? Do cataracts require special aid by nurses or attendants? What should the procedure be in a government institution? The question has arisen for discussion from the administrative point of view.

M.D., Florida.

ANSWER.—Every ophthalmic surgeon of experience has his own views on the postoperative care of cataract patients, with the result that there is no established uniformity of procedure. Before the present shortage of nurses existed it was thought

that each patient should have private nursing care when possible, but now it appears that the eyes are just as good under general floor nursing care, a procedure that can be utilized in governmental institutions as well as in private hospitals.

In general, the following orders cover the after-care recommended by the majority of ophthalmic surgeons: 1. Absolute bed rest for three to five days; for the first twelve hours the patient should be on his back but then may be turned to the unoperated side and propped with pillows. The back rest may be up one, two or three notches according to desire. A head pillow is permitted. The prone position should be avoided unless requested by the patient. According to the surgeon and the progress of wound healing, the patient may be assisted into a chair on the third to the fifth day and stay up as long as desired. No walking should be permitted before the seventh day. The average stay in the hospital is ten to fourteen days. 2. A liquid diet is advised for the first forty-eight hours, a soft diet for the next five days and a nonchewy diet for the remainder. 3. An enema may be given on the third day if necessary. The patient must be fed by nurses while both eyes are bandaged. Subsequently liquid petrolatum or enemas may be used as necessary. 4. No bathing for three days, then sponge baths in bed. 5. No visitors for three days. 6. Sedatives at bedtime for three days—after that, as required. 7. Dressing of the eyes is performed only by the surgeon. A protective mask is to be worn and kept in position at all times. In general, these orders cover the requirements for postcataract care but have to be modified according to the exigencies of each case.

PROTECTION AGAINST HARMFUL SUNLIGHT

To the Editor:—For the past two years I have been afflicted with a sensitivity to sunlight which causes a rash on my face, diagnosed as a potential lupus erythematosus. On exposure to ultraviolet rays the rash did not appear, so it can be assumed that those wavelengths are not responsible. Porphyrin bodies have not been found in the urine. I have been experimenting with a mask of cellophane and with protective ointments. Would you please inform me as to the various ointments used and of any similar mask which has proved effective, and how the latter could be obtained?

Captain, M. C., A. U. S.

ANSWER.—Information on cellophane or other masks has not been obtained. Most plastics have no value for the exclusion of light. The claims made for various invisible oils or ointments as protection against light have not been substantiated by careful experiment. Strakosch, for instance (*The Role of Bases in Ointments Used for Protection Against Sunlight, J. Invest. Dermat.* 5:1 [Feb.] 1942), found that neither petrolatum nor lanolin gave any protection in thin layers. He thinks that Raabe's claim for yellow petrolatum was based on the use of a thick layer. The addition of quinine or tannic acid to these bases added no protective effect; but with aquaphor and Abbott's Ninol base they did add to the protective action. Epstein (*Studies in Abnormal Human Sensitivity to Light, J. Invest. Dermat.* 5:187 [Aug.] 1942) reports that some of his patients obtained benefit from ointments containing tannic acid or resorcinol.

The best protection from light should be obtained from preparations impervious to light, such as zinc paste or modifications of it. Fantus and Dyniewicz (*Cuticolor Preparations, J. Am. Pharm. A.* 27:878 [Oct.] 1938) proposed an improvement on calamine powder consisting of zinc oxide or, better, titanium dioxide, colored with a mixture of the red and yellow oxides of iron, with blood charcoal to darken it to correspond to brunette complexions. They used red ferric oxide 3 Gm., yellow ferric oxide 4 Gm. and zinc oxide 93 Gm. or, for a better covering preparation, red ferric oxide 6 Gm., yellow ferric oxide 8 Gm. and titanium dioxide 86 Gm. They remark "Should clinical trial justify the greater expense, it may become desirable to employ the titanium dioxide instead of the zinc oxide in all these preparations. We find the titanium dioxide a necessary ingredient of the cuticolor cream salve that may be used for covering skin blemishes." The formula of this is cuticolor titanium dioxide 30 Gm., glycerin 1.5 cc. and vanishing cream 70 Gm. Mix thoroughly. With different lots of the pigments, the proportions must be varied and, of course, are variable to suit different complexions. If desired, the cuticolor powder may be used in a lotion, suspending 15 Gm. in 100 cc. of rose water in which 2.5 Gm. of bentonite has been suspended. The bentonite suspension should stand for several hours and the supernatant fluid be decanted to get rid of any larger particles. Then add the cuticolor powder to the decanted portion. A greaseless paste may be made by rubbing up cuticolor powder 15 Gm. and bentonite (sifted) 10 Gm. with rose water 75 cc.

Epstein mentions a case of prurigo estivalis that cleared after a course of histaminase, while others did not, and quotes O'Leary, who also had good results from histamine desensitization and from histaminase. Epstein remarks that torantil,

a preparation of histaminase, varies in strength, which may account for the discrepancies in results.

Civatte, Tzanck and Sidi (*Bull. Soc. franç. de dermat. et syph.* 46:1344 [Sept.-Oct.] 1939), whose article is abstracted in the *Archives of Dermatology and Syphilology* 43:855 (May) 1941, obtained benefit in cases of lupus erythematosus by medication with niacin amide, apparently causing a suspension of sensitivity. Keining (Untersuchungen über das Indikationsgebiet des PP-Faktors [Nikotinsäureamid] bei Hautkrankheiten, *Dermat. Wchnschr.* 112:302 [April 12] 1941) reports success in the treatment of some cases of lupus erythematosus-like eruptions evidently sensitive to light, for they recurred early in spring, by a few daily injections of niacin amide. In 1 case a slight recurrence in the fall yielded again to the injections. In a case of "summer eruption" the action was slower, and in some cases of lupus erythematosus there was no benefit.

It is suggested that, if resorcinol or quinine is tried, the skin be patch tested first to guard against the possibility of sensitization to these drugs, both of which are notorious allergens.

VARICOSE ULCERS

To the Editor:—A woman aged 49, who weighs about 250 pounds (113 Kg.), has had considerable trouble with varicose veins and ulcers on her legs from the knee to the ankle since her last confinement thirteen years ago. She has had various treatments with intravenous sclerosing agents, but not the McPheters operation of opening the vein in Scarpa's triangle. Now the leg from the knee to the ankle is a deep purple and has the feeling of dead tissue. When she bumps it there is an open sore, which is slow in healing. Her urine and blood pressure are normal. She has consulted me in regard to the use of the new drug tyrothricin in her case.

M.D., Missouri.

ANSWER.—The state of venous circulation must be first investigated by suitable tests. These have been described and illustrated by a pamphlet on varicose veins published by the American Medical Association and reprinted in 1941. If the deep venous circulation is impaired, neither ligation nor sclerosing injections can help; in fact, such procedures may aggravate the circulatory insufficiency. Thrombophlebitic ulcerations heal slowly, not only because of venous stasis, but because they are often surrounded by a collar of fibrous, avascular tissue which interferes with tissue repair. Secondary infection with aerobic and anaerobic bacteria often aggravates the picture.

Tyrothricin is the name applied by Hotchkiss and Dubos to an alcohol soluble and water insoluble fraction which is obtained from a culture of aerobic sporulating bacilli found in soil. This is not a pure substance and two crystalline materials, tyrocidin and gramicidin, have been separated out. Tyrocidin is essentially ineffective in the living tissue, since serum and tissue juice inhibit its action to a considerable degree. Gramicidin, on the other hand, is highly effective when applied locally against gram positive organisms such as pneumococci, streptococci, staphylococci and diphtheria bacilli. It is not particularly valuable in mixed infections and cannot exert much effect when the circulation is poor.

In the case under consideration, if a bacteriologic study yields gram positive organisms and if the circulation can be improved by adequate elevation and fomentation, a local application of gramicidin might be of help. It will combat only the superimposed infection of a thrombophlebitic ulcer and will not remove its cause or inhibit its recurrence.

SULFONAMIDE THERAPY FOR PATIENTS ON RESTRICTED SODIUM DIETS

To the Editor:—When using sulfonamides it is frequently necessary to administer alkalis. This raises a problem in connection with patients who are on restricted sodium diets; for example, those with cardiac edema and toxemias of pregnancy. What is the solution to this complication?

Robert C. Tavlin, M.D., Chicago.

ANSWER.—The prevention of kidney complications in patients receiving the sulfonamides is greatly aided by alkalization of the urine and the maintenance of an adequate fluid balance. In patients with edema, particularly those whose edema is due to cardiac failure or renal dysfunction associated with nitrogen retention, the problem is not readily solved. In cardiac failure it is often necessary to restrict fluids unless the patient can be maintained on a dietary regimen in which the intake of sodium is restricted to less than 1 Gm. of sodium chloride a day. In addition, sodium salts should not be given to alkalize the urine. While potassium salts may be used, they must be given with due caution to patients having renal dysfunction, and especially to persons having uremia. However, this is one solution to the problem. Another possibility is to reduce the total dose of the sulfonamides to a minimum. In other words, relatively small doses of a sulfonamide are necessary for the treatment of a

urinary tract infection. It should be remembered that sulfanilamide rarely if at all causes kidney complications, and several types of pyogenic infections may be treated with this drug. With more and more penicillin being made available for civilian distribution, this material may be used instead of the sulfonamides in conditions in which it is indicated.

ALKALIZATION BY PARENTERAL ROUTE

To the Editor:—Can you give me a plan for administering alkali parenterally? Specifically, how much (and of which preparation) should be given intravenously to render the urine alkaline when the oral route is not available—particularly when sulfonamides are being used?

Robert C. Tavlin, M.D., Chicago.

ANSWER.—Alkalization of the urine by parenteral administration is accomplished by supplying an excess of basic ions. This can be accomplished with sodium lactate or sodium bicarbonate, the lactate or bicarbonate radical being metabolized in the body, thus leaving an excess of sodium ion. Sodium lactate is usually preferred, as it is less strongly alkaline than sodium bicarbonate. Sodium lactate can be obtained in a sixth molar concentration commercially for intravenous use. The concentration is isotonic. Gilligan, Garb and Wheeler reported that during administration of sulfadiazine 15.6 Gm. of sodium bicarbonate orally was adequate to render the urine consistently alkaline. With a dosage of 13.7 Gm. of sodium bicarbonate 15 per cent of the patients had acid urine. One hundred cc. of sixth molar sodium lactate is equivalent to 1.4 Gm. of sodium bicarbonate. Therefore 1,100 cc. of sixth molar sodium lactate solution is equivalent to 15.6 Gm. of sodium bicarbonate. In 2 of the cases reported by Gilligan, Garb and Wheeler 1,000 cc. of sixth molar sodium lactate was given intravenously in divided doses daily, and the urine remained alkaline. They advised continuing the alkali for one day after discontinuing the sulfonamide.

Reference:

Gilligan, Dorothy Rourke; Garb, Solomon, and Wheeler, Norman: Adjuvant Alkali Therapy in the Prevention of Renal Complications from Sulfadiazine, *THE JOURNAL*, Aug. 21, 1943, p. 1160.

DRUGS CAUSING APLASTIC ANEMIA

To the Editor:—At present in our hospital there is a soldier with aplastic anemia. The only medication prior to the discovery of this condition was elixir of terpin hydrate with codeine (0.008 Gm. in 4 cc.), acetylsalicylic acid and castor oil (15 cc.). The question is Can this medication cause a depression in the function of the bone marrow? If so, which one, and can authorities be cited?

Captain, M. C., A. U. S.

ANSWER.—Although it is well known that certain drugs may so depress the function of the bone marrow as to produce aplastic anemia, this drug has never been mentioned, i. e. elixir of terpin hydrate. There is no evidence that codeine, acetylsalicylic or castor oil is capable of this effect. According to present knowledge, the only drugs capable of depressing the function of the bone marrow include those that have the benzene ring as their central structure.

COITUS RESERVATUS

To the Editor:—There seems to be some controversy as to the merits and demerits of the practice of coitus reservatus. I cannot find any agreement on the matter; in fact there seems to be little of a reliable nature published on the subject. I wish to know especially whether the practice is harmful from the point of view of possible harm to the prostate gland, and i. e., would it tend over a long period to produce chronic congestion and resultant troubles? What effect would age be apt to have on such a practice? Anything of a scientific nature or anything in the way of opinion, even, if given by a qualified person, will be greatly appreciated.

M.D., Maine.

ANSWER.—It is thought that the practice of coitus reservatus produces a congestion in the region of the posterior urethra which may possibly predispose to a prostatitis. There is no evidence that age would have any effect on such a practice except as coitus itself is limited by the two extremes of life.

PINWORMS AND TAPEWORMS IN DOGS

To the Editor:—I am writing for information concerning dogs and pinworms. Can and do human beings have the same type and strain of pinworms as dogs? Are there any injections that can be given to dogs to immunize against pinworms? Can human beings be infected by contact with dogs or their excreta?

S. T. Rogers, M.D., New Albany, Ind.

ANSWER.—Dogs do not suffer from pinworm infection. The tapeworm segments which dogs pass simulate pinworms, but on close inspection of a fresh specimen the difference will be readily noted. According to published opinions the chances for infecting human beings with tapeworm segments are remote.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 8

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

OCTOBER 21, 1944

HYPOGLYCEMIA AND RESTORATION WITH GLUCOSE

CHAIRMAN'S ADDRESS

FRANK C. MANN, M.D.
ROCHESTER, MINN.

It has been known for almost a century that the concentration of the sugar in the blood might under certain conditions decrease to a very low value, but it has been only a little more than two decades since it was learned that a characteristic group of symptoms followed by death developed in hypoglycemia and that the administration of suitable amounts of glucose would restore the moribund organism in hypoglycemia to normal. The concomitant development of the characteristic symptoms associated with hypoglycemia and the restoration of the dying organism to a quick and complete recovery by glucose are not only among the most dramatic but also some of the most constant biologic phenomena noted in the higher forms of animals. It is my purpose in this paper to present briefly the current knowledge concerning these two physiologic processes which has been obtained from a review and evaluation of the results of a large number of investigations.

It has been conclusively demonstrated that a constant supply of glucose is essential for life in the higher organisms. If the glucose content of the blood decreases below a minimal value, death invariably occurs. Since the sources of glucose available in nature are many, varied and usually not in the form of the substance itself, elaborate physiologic mechanisms are necessary to insure a constant supply of this vital substance to the tissues of the body. The gastrointestinal tract affords the means by which glucose is obtained for the organism from the crude substances in which the sugar occurs or from which it can be made. The rate at which glucose enters the body from the intestinal tract is variable. There is a plethora of glucose during the time of absorption from the alimentary tract and a deficiency between periods of feeding. In order to maintain a life sustaining amount of glucose in the blood a regulatory mechanism within the body is absolutely essential. The maintenance of the sugar content of the blood is a physiologic responsibility of the liver.

The exact mechanisms involved in the maintenance of the blood sugar values under the varying physiologic requirements for glucose are not fully understood, but

it has been definitely proved that the liver is essential. The liver has been removed from a large number of animals including representatives of several species. In no instance has the blood sugar failed to decrease in the dehepatized animal and in no instance has there been a restoration of the blood sugar after removal of the liver except as a result of the administration of glucose or substances from which glucose could readily be made within the liverless body. The liver is necessary for maintaining the concentration of sugar of the blood, and compensation for loss of this hepatic function can be made only by the artificial administration of glucose. The evidence would indicate conclusively that the liver is always either directly or indirectly involved in hypoglycemia.

The function of the liver of supplying glucose to the blood depends on the ability and capacity of the hepatic tissue for storing and making glucose. Glucose is stored in the liver in the form of glycogen and made by the hepatic cells from a large number of substances. It has been shown that glycogen is made from glucose when the concentration of the sugar in the blood reaching the liver is above the physiologic level being maintained at that particular time. The liver makes glucose and glycogen from the other carbohydrate substances that are absorbed from the intestine. The liver also makes glucose from noncarbohydrate foodstuffs. Carbohydrate can be derived from both protein and the glycerol fraction of fat. The processes whereby these noncarbohydrate substances are made into glucose and glycogen occur mainly, if not wholly, in the liver. Certain intermediary metabolites of extrahepatic tissues are converted into glycogen by the hepatic tissue.

Glycogen is found in many tissues of the body besides the liver. The total amount of glycogen in the muscle tissue exceeds the amount in the liver. Tissues other than the liver and muscle normally contain only small amounts of glycogen. The evidence would indicate that the enzymes in the extrahepatic tissues which contain glycogen convert it into substances other than glucose. It has been proved that glycogen in the muscle does not give origin to blood sugar and it has not been proved that the sugar of the blood can originate from the glycogen found in tissues other than the liver. Likewise the existing evidence indicates that only small amounts of glucose can be made from other substances in tissues outside the liver. While it cannot be stated that extrahepatic tissues do not aid the liver in the maintenance of the blood sugar either by a glycogen stage or by the direct formation of glucose, such aid must be very feeble. The fact that fatal hypoglycemia always follows removal of the liver is sufficient proof that, if extrahepatic sources of blood sugar exist, they

From the Division of Experimental Medicine, Mayo Foundation.
Read before the Section on Pathology and Physiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

are totally incapable of supplying the needs of the body for glucose.

Restoration in hypoglycemia is specific for glucose. Conclusive proof for this statement is derived from observations on the dehepatized animal because, when the liver is present, partial restoration of the blood sugar in hypoglycemia can be brought about by the administration of substances which stimulate the liver to secrete sugar into the blood. A very large number of substances have been injected into dehepatized animals in hypoglycemia for the purpose of resuscitation. The results of these experiments are very definite and conclusive. The dehepatized animal in hypoglycemia is restored to normal only by glucose or substances from which glucose can be made in the tissues of the body outside the liver. All substances used to date, with the exception of glucose and those substances that can be converted to glucose extrahepatically, have proved to be ineffectual in the prevention of death of the hypoglycemic, liverless animal. These two facts, (1) that a lack of glucose in the blood causes death and (2) that glucose alone is specific for restoration in hypoglycemia, prove conclusively that a minimal amount of glucose is required and is constantly being utilized in some manner by the animal organism during life.

A decrease of the concentration of blood sugar to values which are followed by symptoms and death may be due to many causes. Hypoglycemia may be due to the following general causes: (1) utilization of glucose faster than it can be supplied, (2) dearth of glucose and substances from which glucose can be made, (3) failure of the intrinsic hepatic mechanisms for storage, synthesis or secretion of glucose or (4) primary hepatic insufficiency. Since most of the glucose supplied to the body is utilized in the extrahepatic tissues, anhepatic processes may profoundly alter the rate at which glucose is withdrawn from the blood. Certain anhepatic processes are also essential for providing the hepatic tissues with some of the substances from which glucose is made within the liver. The intrinsic hepatic mechanism for providing glucose for the body is affected by substances produced in extrahepatic tissues. Primary hepatic insufficiency may cause hypoglycemia, but it should be noted that only a small percentage of the normal amount of hepatic tissue is required for the maintenance of the normal blood sugar values.

There are numerous anhepatic substances and processes which are of fundamental importance in regard to the maintenance of the concentration of glucose in the blood. Among these, certain endocrine substances and types of metabolism are of great significance. In most instances, in spite of a vast amount of creditable research, agreement is lacking in regard to the mechanisms whereby the various hormones affect the blood sugar. An interesting chapter in physiology will have been written when the various phases of these mechanisms have been conclusively demonstrated. There is a considerable bulk of evidence which indicates that the type of food being utilized in preponderance in the extrahepatic tissues greatly alters the mechanism for control of the blood sugar.

Several interesting hypotheses have been developed in explanation of the cause of the symptoms in hypoglycemia. The data obtained for the support of these hypotheses have been of considerable value in clarifying certain phases of the phenomenon. Since the major symptoms of hypoglycemia indicate that the functions

of the nervous system are primarily affected and since glucose is very important in metabolism, the more pertinent investigations on the cause of the symptoms of hypoglycemia have dealt with the metabolism of the brain.

A considerable amount of evidence has been accumulated from various sources which indicates that glucose is the main if not the only source of energy for the brain. The results of a number of investigations on the oxygen consumption and carbon dioxide production of brain tissue *in vivo* agree in general that the oxygen consumption is high and that the respiratory quotient is usually about unity. The results of studies on the metabolism of slices of brain tissue are in accord with those of the studies of the brain tissue *in vivo*. While the results of none of these investigations, because of the possibility of error owing to the methods that had to be used, should be accepted without qualification and in spite of the fact that a serious error was made in regarding glucose as the only source of energy for muscular contraction, it would appear highly probable that the brain obtains, at the least, most of its energy from the combustion of carbohydrate.

The results of investigation of the metabolism of the brain in hypoglycemia as well as the results of studies on the interrelation between anoxia, asphyxia and hypoglycemia indicate that the oxidative metabolism of the brain is diminished in hypoglycemia. This finding provides an explanation for the sequence of the development of the symptoms of hypoglycemia. The decrease of blood sugar affects various regions of the brain successively, beginning with the cerebral hemispheres and ending with the vital centers in the medulla. This definite order of the symptoms is predicated on the basis that the lack of glucose affects the brain cells having the highest rate of metabolism first. In this connection it should be noted that other factors are also involved because the symptoms of hypoglycemia may develop, under certain conditions, at a blood sugar value which, though decreased from its immediate previous value, is above the normal level.

The mechanism whereby hypoglycemia causes death and the action of glucose in producing restoration remain as important and only partially solved problems. It was noted in the first experiments on the dehepatized animal in which hypoglycemia was recognized as a cause of death that the respiration always stopped before the heart. It is usually possible to restore the animal in hypoglycemia after respiration has ceased by the application of artificial respiration while injecting glucose. As previously mentioned, all the major symptoms that appear in hypoglycemia can be referred to functional alterations in the central nervous system. The discernible effect of glucose is to restore the functional activity of the brain. These facts would appear to prove that the central nervous system constantly requires the presence of glucose in order to function. It is not so evident that other tissues also require glucose to maintain life. In this connection it should be noted that isolated organs as well as isolated tissues are often studied under a condition of hypoglycemia. Some of the functions of perfused organs appear to be performed normally in the absence of glucose in the perfusate or the organ itself. It would appear that life and function can be maintained in some tissues without glucose.

While the discovery that a certain concentration of glucose in the blood is essential for life was made on the dehepatized animal, most of the facts that are known about the effects of a low blood sugar on the various physiologic activities of the body have been learned through the use of insulin because it is easier to produce hypoglycemia with insulin than by any other known method. The results of studies on hypoglycemia produced by removal of the liver and the injection of insulin have been mutually corroborative. It would appear that the cause of the symptoms and death in hypoglycemia is the same regardless of the mechanism producing the decrease of blood sugar. However, there is one great difference between the restoration of the organism in hypoglycemia due to removal of the liver and in that due to other causes. While glucose is effective in restoring the hypoglycemic organism to normal, provided the lack of glucose has not persisted for too long a period, regardless of the cause of the hypoglycemia, in the absence of the liver the period of restoration is only temporary while in the presence of the liver it is permanent or persists until the causative agent is again active. A permanent recovery from hypoglycemia always depends on hepatic activity.

Since the presence of the liver has remained as a possible source of error in the interpretation of the results of studies on hypoglycemia produced by extrahepatic causes, my colleagues and I have recently attempted to develop a method for the study of a preparation which not only is practically glucose free but also is incapable of receiving glucose except by administration. The objective of the research was to attempt to maintain artificially those functions of the body loss of which, owing to the hypoglycemia, appeared to be the cause of death and thus determine the physiologic activities that would persist in the absence of glucose.

Briefly the method is as follows: The liver is removed in the usual manner. When the animal exhibits the first symptoms of hypoglycemia, the trachea is intubated and respiration is maintained artificially after spontaneous respiratory movements cease. Transfusions of whole blood are given to aid in supporting blood pressure.

While progress has not been made toward our major objectives, some pertinent findings have been noted. Blood pressure progressively decreases as the animal becomes flaccid in hypoglycemia, and the central vasomotor mechanism ceases to function shortly after respiratory movements stop. While it is easy to substitute for the lost respiratory function, it has so far been impossible to restore blood pressure, although we have been able to maintain it at a very low level for a few hours. The transfusion of whole blood will increase blood pressure for short periods, but even the injection of very large amounts of blood, more than the estimated total amount of the animal's blood volume, will restore blood pressure for only a short period. The very small amount of glucose in the blood appears to be more effective in increasing the blood pressure than the increase of blood volume.

Cardiac action and a low blood pressure have been maintained for several hours after respiratory movements had ceased. The reducible substances in the blood were at very low values, indicating that the organism was practically glucose free. No evidence of

activity of the central nervous system could be detected. The injection of glucose restored respiration and partially restored blood pressure, many of the reflexes returned and uncoordinated movements occurred. However, there was no evidence of return of cerebral function.

SUMMARY

The maintenance of a definite concentration of glucose in the blood is a physiologic constant. If the blood sugar decreases below a certain critical level, definite and characteristic symptoms appear, followed by death. The physiologic responsibility for maintaining a life supporting amount of glucose in the blood belongs to the liver, but many extrahepatic factors and mechanisms cause variations of the blood sugar to occur. The major symptoms and death in hypoglycemia are due to the effect of the lack of an adequate amount of glucose for the central nervous system, which requires the presence of glucose in order to function. Glucose is essential for life in the higher organisms and appears to be as irreplaceable as oxygen.

FIBRIN FOAM AS A HEMOSTATIC AGENT IN REHABILITATION NEUROSURGERY

MAJOR BARNES WOODHALL

MEDICAL CORPS, ARMY OF THE UNITED STATES

The introduction by Ingraham and Bailey¹ of fibrin foam² as a hemostatic agent in neurologic surgery marks a technical advance as significant as the earlier introductions of the silver clip and the electrocautery. The control of hemorrhage from small or moderate sized vessels in the brain or spinal neuroaxis by electrocoagulation or clipping is relatively standardized and has been proved satisfactory. The control of capillary bleeding from the substance of the brain or spinal cord, from small vessels over the surface of the medulla or spinal cord or from the vascular supply of peripheral nerves cannot be accomplished by these destructive measures. Nor is it feasible to control gross hemorrhage from tumor beds or lacerated venous sinuses by these technics. For these purposes, cotton patties soaked in warm saline solution or muscle stamps have been used. As Ingraham has pointed out, everyday experience has indicated that these methods may be both time consuming and ineffectual in securing complete hemostasis and, in addition, the use of muscle may be followed by considerable tissue reaction.

Ingraham has recounted the history of the search for an adsorbable hemostatic agent culminating in that prepared from material entirely of human origin by Bering.³ In the same paper microscopic studies in

From the Neurosurgical Section of the Walter Reed General Hospital, Washington, D. C.

1. Ingraham, F. D., and Bailey, O. T.: The Use of Products Prepared from Human Fibrinogen and Human Thrombin in Neurosurgery. Fibrin Foams as Hemostatic Agents; Fibrin Films in Repair of Dural Defects and in Prevention of Meningocerebral Adhesions, *J. Neurosurg.* 1: 23-39 (Jan.) 1944. Ingraham, F. D.; Bailey, O. T., and Nulsen, F. E. Studies on Fibrin Foam as a Hemostatic Agent in Neurosurgery, with Special Reference to Its Comparison with Muscle, *ibid.* 1: 171-181 (May) 1944.

2. This substance was developed under a contract recommended by the Committee on Medical Research between the Office of Scientific Research and Harvard University.

3. Bering, E. A., Jr.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: XXII The Development of Fibrin Foam as a Hemostatic Agent for Use in Conjunction with Human Thrombin, *J. Clin. Investigation*, to be published.

animals and further clinical and microscopic studies in 95 neurosurgical procedures in man have established the present hemostatic value of fibrin foam and the negligible tissue reaction incident to its use. Through the courtesy of Dr. Franc Ingraham and the members of the Department of Physical Chemistry of Harvard Medical School, fibrin foam was made available to the Neurosurgical Section of the Walter Reed General Hospital in the fall of 1943. Since Jan. 1, 1944 increased production of this substance has allowed its use in a total number of 226 neurosurgical operations. The general character of the diagnoses for which these operations were performed are listed in the accompanying table.

These cases do not represent a valid numerical cross section of material commonly treated in an Army Neurosurgical Center, nor do they indicate necessarily procedures in which there exists a definite need for fibrin foam as a hemostatic agent. They do represent a group of neurosurgical operations in which the value of fibrin foam was explored or in which it was used for some specific technical purpose in which complete hemostasis was desirable. The field of rehabilitation or reparative military neurosurgery is a restricted one. Its paramount task lies in the treatment of nerve injuries

Neurosurgical Operations in Which Fibrin Foam Was Used

	Number
Rupture of intervertebral disk.....	102
Peripheral nerve injury.....	86
Tantalum plating of skull defect.....	23
Craniotomy for brain tumor.....	9
Laminectomy.....	5
Acute cerebral laceration.....	1
	226

by the procedures of neurolysis, neurorrhaphy or nerve grafting. Next in importance is the evaluation of the sequelae of head injuries and, in particular, the repair of skull defects and associated pathologic changes in the dura and brain. In addition to actual war casualties, the military neurosurgeon in the zone of the interior must treat casual illness and injury among military personnel, and of these the most important from the point of view of numbers is that of rupture of an intervertebral disk. Finally, to the Neurosurgical Center gravitate cerebral and spinal cord tumors. Acute cerebral injuries are comparatively rare.

It is apparent then that specific problems in hemostasis may arise in this restricted but, at the moment, important field of neurosurgery. They may be listed as the control of hemorrhage from extrinsic nerve scar, from nerve ends prepared for suture or grafting, from repair of dural or cerebral cicatrices, from extradural spinal veins and finally from tumor beds. It seems obvious that such experience may be transposed readily to the neurosurgery of more active theaters. The characteristics and clinical usage of fibrin foam may be illustrated best by comment on individual cases:

CASE 1.—Rupture of an intervertebral disk. Hemilaminectomy. Reexploration.

E. D. B., T/5, aged 31, developed the classic symptoms and signs of a rupture of the intervertebral disk at the fifth lumbar interspace on the left side, and the diagnosis was confirmed by pantopaque myelography.

On March 1, 1944, after resection of the ligamentum flavum at the fifth lumbar interspace on the left side, a large herniated nucleus pulposus was removed. Prior to removal the extradural veins had been collapsed by cotton patties. When these patties were lifted from the operative field a vigorous venous hemorrhage ensued. After the point of bleeding had been cleared with suction, a small, irregular mass of fibrin foam was applied over the bleeding area and gently compressed with a moist saline pledget. The hemorrhage ceased at once. The nerve root was allowed to assume its normal position and was covered with several additional masses of fibrin foam, filling the interlaminar defect. A severe contralateral sciatica developed and on March 21 the operative area was reexplored in the course of its relief. The fibrin foam had degenerated or had been adsorbed to some extent and remained as irregular, friable fragments. The spinal root of the first sacral was freely movable and not adherent to adjacent structures. The sciatica subsided after decompression of the first sacral root on the left.

The control of this relatively uncomplicated type of hemorrhage justifies a brief description of fibrin foam for those who are unfamiliar with its characteristics and usage. Fibrin foam is prepared from human fibrinogen and human thrombin and in the dry state appears dull white, dry and brittle. A fairly large mass of fibrin foam is packaged sterile in a dry state with a vial of dried human thrombin. A third vial contains 30 cc. of sterile isotonic solution of sodium chloride. At the operating table the thrombin is dissolved in the saline solution by means of vigorous stirring. Rather large fragments of fibrin foam are dropped into the thrombin solution. Further stirring will cause fragmentation of the fibrin foam into pieces too small for practical use. Fragments of the foam may then be cut or formed as the technical situation demands. As prepared at present the amount is sufficient for craniotomy. It may be used economically for successive disk or nerve cases by removal of a single fragment of foam prior to operation and by aspiration of sufficient thrombin solution to penetrate the fibrin matrix of this fragment.

The use of fibrin foam for the control of venous hemorrhage incidental to removal of a herniated nucleus pulposus appears to be a distinct contribution to more refined disk surgery. Such hemorrhage may be controlled by pressure of a warm saline pledget of cotton or by a muscle stamp. It is vastly simplified by the use of fibrin foam. From the single observation made twenty-one days after hemilaminectomy, it likewise appears that fibrin foam may prevent adherence of the nerve root to adjacent tissues and may prevent as well scar tissue formation from a resolving post-operative hematoma in the region of the laminal interspace. Both sequelae of disk surgery may account for residual or recurrent postoperative sciatic pain.

CASE 2.—Mortar shell injury to peroneal and tibial nerves. Neurolysis. Neurorrhaphy.

C. G. H., 2d lieutenant, aged 31, received multiple wounds from mortar shell fragments on Jan. 21, 1944, including one in the right popliteal space. Neurologic examination suggested a complete section of the common peroneal nerve and an incomplete lesion of the tibial nerve. On April 17 the injured area was explored. An end to end tantalum wire suture of the common peroneal nerve and a neurolysis of the tibial nerve were performed. Regeneration has proceeded at a normal rate since operation.

The methods for the control of hemorrhage from the involved peripheral nerves in this case by the use of fibrin foam were identical with those followed in the

remaining cases of this series. It is not an uncommon accident during neurolysis or transposition of a peripheral nerve to divide a longitudinal or entering epineural artery or vein. Such hemorrhage closely adjacent to living axons cannot be controlled by the application of a silver clip or by the use of the electrocautery. The application of a 3 to 4 millimeter fragment of fibrin foam, followed by pressure exerted on a moist cotton patty, controls such hemorrhage completely and should not be followed by tissue reaction seen after the use of a muscle stamp. The fibrin foam mass should be left in place. Excessive hemorrhage from nerve ends transected for nerve suture or nerve grafting may militate against the success of the intended procedure. The patient, successive application of foam fragments with firm pressure conducted through moist cotton pledgets will eventually control this troublesome hemorrhage. No resultant edema or other changes in the structure of the nerve ends have been observed. No opportunity has developed to study foam fragments at secondary operation in such injuries.

CASE 3.—Resection of cerebral cicatrix. Tantalum plating of skull defect.

A. J. L., 2d lieutenant, aged 25, sustained a mortar shell injury of the right parietal region of the skull on Dec. 23, 1943 with involvement of scalp, skull, dura and cerebral tissue. Débridement was done within ten hours of the injury and the convalescence was uneventful. On admission to the Walter Reed General Hospital on March 25, 1944 he showed a residual and rapidly clearing left hemiplegia and an oval pulsating defect in the right parietal area. Electroencephalography revealed high voltage 2 to 3 second waves with slow wave, out of phase focus over the site of injury. On May 10 a shallow cortical scar was resected and the skull defect repaired with tantalum. Postoperative study of electrical activity of the cortex showed much improvement with abnormal waves appearing only with hyperventilation.

In this instance the area of cortical resection was filled with broad, thin sheets of fibrin foam, approximately 2 to 5 mm. thick, with prompt cessation of hemorrhage. This procedure has been followed in other scar resections with equal success. In all cases requiring skull defect repair the extradural bleeding that may follow revision of the dura has been controlled by small fragments placed between dura and bone, insuring complete hemostasis beneath the plate.

CASE 4.—Resection of occipital lobe and glioblastoma.

W. L. B., private, aged 23, a Negro, developed headache, vomiting, diminished visual acuity and mental confusion over a period of three months. On admission, neurologic examination noted irrationality and confusion with cervical rigidity, minimal papilledema and no localizing signs of import. Ventriculography disclosed a cyst with ragged, irregular contours in the right occipital lobe. On May 12, 1944 the right occipital lobe was resected through the confluence of the body and posterior horn of the lateral ventricle. During this procedure a large posterior cerebral vein tore away from the longitudinal sinus. The ensuing venous hemorrhage was promptly and permanently controlled by a thick stamp of fibrin foam, held in place by firm pressure over a moist cotton strip. Convalescence from craniotomy was uneventful.

In eight more or less similar cerebral resections for tumor, either oozing from cerebral tissue or massive arterial and venous hemorrhage from tumor bed or sinus apertures have been controlled effectively. A striking example of the effectiveness of this hemostatic agent is afforded by a perusal of the following case:

CASE 5.—Complete removal of acoustic neurinoma, right.

S. K.; T/3, aged 26, was operated on in an overseas theater for cerebellar tumor. The procedure was terminated prematurely because of excessive hemorrhage from the right lateral recess. The neurologic findings were typical of a cerebello-pontine angle tumor on the right. On April 20, 1944 a right acoustic neurinoma was resected completely. Diffuse, moderately severe hemorrhage from poorly visualized vessels lying along the lateral and anterior borders of the pons was controlled readily by the application of narrow strips of fibrin foam. On April 28 the craniotomy wound was reexplored because of hyperpyrexia and increased intracranial pressure. The lateral recess was clear and the fibrin foam could be seen as an irregular, reddish brown, granular mass without significant tissue reaction. The operative area was sterile. Following spinofacial anastomosis the patient was sent on a therapeutic furlough.

CASE 6.—Bifrontal, compound, depressed skull fracture with cerebral laceration.

B. L., corporal, aged 24, was engaged in welding a 50 gallon steel drum when an explosion of unknown origin occurred. A fragment of steel penetrated above the nasion; its removal was followed by drainage of brain tissue and cerebrospinal fluid from the laceration and from the nose. A débridement was carried out twenty-four hours after the injury through a transverse, midfrontal laceration 9 cm. long. The medial and inferior surfaces of both frontal lobes were extensively lacerated. After electrocauterization of moderate sized arteries and veins, diffuse hemorrhage persisted in spite of warm saline cotton packs. This bleeding was controlled instantly by the application of thin, round disks of fibrin foam. Bilateral dural grafts were sutured in place and the soldier has returned to duty.

This experience, although an isolated one, justifies a thorough clinical trial of this hemostatic agent in the field of acute cerebral injuries.

SUMMARY

Fibrin foam has been used as a hemostatic agent in 226 neurosurgical operations completed in an Army Neurosurgical Center. The technical procedures have consisted of peripheral nerve neurolysis, neuroorrhaphy and nerve graft, excision of cerebral scar with tantalum plating of skull defects, hemilaminectomy for rupture of an intervertebral disk, craniotomy for tumor, laminectomy and débridement for acute cerebral injury. In each instance the desired hemostatic effect has been secured promptly and has contributed in large measure to the execution of the particular operation. No clinical untoward reactions that could have been attributed to the use of fibrin foam have been observed. There were but two opportunities to observe a possible tissue reaction to fibrin foam, and these negative observations were consistent with those previously reported. The application of this method of hemostasis to war injuries of the brain seems most promising.

Hypochondriasis.—Hypochondriasis may be found as a mental habit in a fairly large group of individuals of medium intelligence who have led narrow lives without many interests and who have been prone to accept the statements found in newspapers relative to medicine and advertisements in good faith. They are prone to interpret mild physical discomforts due to fatigue, position or unhygienic living as symptoms of serious physical illness and to react accordingly. It is often most difficult to change their delusions about themselves. They will not even accept the reassurances of the family doctor that they do not show any symptoms of the disease of which they complain, as he cannot tell how they feel. They know they have heart disease because they are so short of breath when they go upstairs, etc.—Davis, John E.: *Principles and Practice of Rehabilitation*, New York, A. S. Barnes & Co., Inc., 1943.

THE MALE CLIMACTERIC. ITS SYMPTOMATOLOGY, DIAGNOSIS AND TREATMENT

USE OF URINARY GONADOTROPINS. THERAPEUTIC TEST WITH TESTOSTERONE PROPIONATE AND TESTICULAR BIOPSIES IN DELINEATING THE MALE CLIMACTERIC FROM PSYCHONEUROSIS AND PSYCHOGENIC IMPOTENCE

CARL G. HELLER, M.D., PH.D.

VANCOUVER, WASH.

AND

GORDON B. MYERS, M.D.

DETROIT

During the past few years several articles¹ have been published in medical journals about a syndrome occurring in middle aged men which has been termed the male climacteric. The syndrome has been characterized principally by nervousness, psychic depression, impaired memory, the inability to concentrate, easy fatigability, insomnia, hot flashes, periodic sweating and loss of sexual vigor. The chief basis for the diagnosis of male climacteric in published reports has been the similarity of the symptoms to those of the female menopause and the relief sometimes afforded by androgenic therapy. The claim has been made² that most men and all women pass through the climacteric during the fifth decade and that the diagnosis of male climacteric is frequently missed. Quite recently this concept has been popularized by Paul de Kruif in the July 1944 issue of *Reader's Digest*, and physicians are deluged with requests for treatment by hopeful readers.

No objective evidence has been brought forward to prove that the male climacteric is an actual clinical entity or to differentiate it conclusively from psychoneurosis or psychogenic impotence. In fact, ordinary clinical experience arouses considerable skepticism as to the existence of the male climacteric because of (a) the similarity between symptoms attributed to this syndrome and those referable to psychoneurosis, (b) the retention of fertility by most men well into old age, (c) the absence of regressive changes in secondary sexual characteristics of most elderly men comparable to those which customarily occur in women after the menopause. In most elderly women there are unmistakable signs of ovarian failure, namely atrophy of the uterus, vagina, external genitalia and breasts, a deepening of the voice, a tendency toward hirsutism and a loss of femi-

nine bodily contours. In contrast, most elderly men exhibit no physical signs of testicular failure: genitalia and secondary sexual characteristics show no regressive changes, beard and bodily hair remain intact, and bodily contours remain masculine. Skepticism toward the existence of the male climacteric is clearly expressed in a recent editorial in *THE JOURNAL*.³

Our purpose in this communication is to present evidence which will provide answers to the following questions: 1. Is there an organic basis for justifying the claim that the male climacteric is a true clinical entity? 2. Is it possible to distinguish between the male climacteric and psychoneurosis or psychogenic impotence either clinically, by laboratory methods or both? 3. If the syndrome exists, what therapy is advisable? 4. Is the male climacteric a normal accompaniment of the aging process or is it a pathologic problem?

To answer the foregoing questions we needed some objective criterion of testicular function. It seemed likely that the titer of urinary gonadotropins might reflect gonadal function in the male as well as in the female.

An elevation in the titer of gonadotropins excreted in the urine has proved to be an accurate index of ovarian failure. This invariably accompanies the naturally occurring female menopause⁴ and follows bilateral oophorectomy within one to four weeks.⁵ The elevated titers of urinary gonadotropins persist for the remainder of the patient's life.⁴ There is considerable evidence to suggest that the abnormally great excretion of gonadotropins is due to failure of utilization of this hormone by the nonfunctioning ovaries.⁶ Therefore it was decided to perform gonadotropic assays in the male.

Before gonadotropic assays could be used for the differentiation between the male climacteric and psychoneurosis, it was necessary to determine whether elevations truly reflected testicular insufficiency. Therefore determinations were made in a series of normal controls ranging from 22 to 98 years of age and in a group of men with known failure of testicular function. The assays were performed in an identical manner on patients complaining of symptoms claimed to be associated with the male climacteric. In addition, microscopic examination of testicular biopsy specimens was made in some of the cases.

METHODS

Urinary gonadotropic excretion was determined on specimens collected during a twelve hour overnight period. These were concentrated by precipitating the protein gonadotropins with 95 per cent ethyl alcohol, subsequently dialysing off toxic substances and reprecipitating with 95 per cent ethyl alcohol. The final precipitate evolving from this procedure was dissolved in 6 cc. of tap water and injected into an immature (22-24 day old) female albino rat in 1 cc. portions twice

Editorial comment on this article appeared in *THE JOURNAL*, Sept. 30, 1944, page 300.

Read in part before the annual meeting of the American Society for Clinical Investigation, Atlantic City, N. J., May 10, 1942.

From the Department of Medicine, Wayne University College of Medicine, and the Endocrinological Clinic of the City of Detroit Receiving Hospital.

The study was supported in part by grants from the Schering Corporation, Bloomfield, N. J., through the courtesy of Dr. Max Gilbert, and from Frederick Stearns & Co., Detroit, through the courtesy of Dr. Richard M. Johnson.

1. Werner, A. A.: The Male Climacteric. *Endocrinology* 26: 1876-1881 (1942).
2. Douglas, R. J.: The Male Climacteric: Its Diagnosis and Treatment. *J. Urol.* 45: 404-410 (March) 1941.

3. Climacteric in Aging Men, editorial, *J. A. M. A.* 118: 458-460 (Feb. 7) 1942.

4. Heller, C. G., and Heller, E. J.: Gonadotropic Hormone: Urine Assays of Normally Cycling, Menopausal, Castrated and Estrin Treated Human Females. *J. Clin. Investigation* 18: 171-178 (Oct.) 1939.

5. Heller, C. G.; Farney, J. P.; Morgan, D. N., and Myers, G. B.: The Development and Correlation of Menopausal Symptoms, Vaginal Smear and Urinary Gonadotropin Changes Following Castration in 27 Women. *J. Clin. Endocrinol.* 4: 101-116 (March) 1944.

6. Heller, C. G.; Heller, E. J., and Sevringhaus, E. L.: Does Estrogen Substitution Materially Inhibit Pituitary Gonadotropic Potency? *Endocrinology* 30: 309-316 (Feb.) 1942.

daily for three days.⁷ The amount of the gonadotropic hormone in the concentrate was determined biologically from the increase in weight of ovaries and uterus at autopsy performed sixteen to twenty-four hours after the last injection was made. It was found expedient to express gonadotropic activity in terms of actual ovarian weights elicited by the concentrate of each twelve hour specimen. Normal ovarian weights for the strain of rats used ranged from 8 to 16.2 mg. and averaged 12 mg.

Histologic technics used on the biopsy specimens of the testes were routine hematoxylin and eosin stains, Masson's trichrome stain and Giemsa's stain.

RESULTS IN MEN WHOSE TESTICULAR FUNCTION
HAD BEEN DEFINITELY ESTABLISHED

Urinary gonadotropic titers of 25 normal men are contrasted with those of 12 surgical castrates and 8 functional prepuberal castrates in chart 1 and table 1.

Normal Men.—Among the normals, all decades were represented from the third through the tenth. All the normal men gave histories of normal sexual function and none had symptoms suggestive of the climacteric. The presence of normal testes was confirmed by biopsy in 10 men, 7 of whom were in the sixth decade or beyond. The 17-ketosteroid excretion was considered normal in 12 cases in which this assay was performed. None of the normals excreted sufficient gonadotropins to cause detectable stimulation of the ovaries of the assay rats. This was evident by the fact that the average ovarian weight after injection with concentrates of the urine of the normal men was only 12.3 mg.,⁸ which is similar to the ovarian weights in uninjected control rats.

Castrated Men.—In contrast, all 12 castrates excreted large amounts of gonadotropins, as shown by the fact that urinary concentrates caused a fivefold increase in

as compared with 12.3 mg. for rats injected with concentrates of urine from normal males. The striking increase in ovarian weight was due partly to follicular maturation and partly to corpus luteum formation. This indicated that the urine of castrate men contained excessive quantities of either of two separate gonado-

TABLE 1.—Gonadotropic Hormone Titrers in Cases of Known and Unknown Testicular Function

	Clinical Category	No. of Cases	No. of Assays	Ovarian Weight, Mg.
Normal controls	Normal males.....	25	47	12.3
Controls consisting of cases of proved testicular failure	Castrated males.....	12	30	62.6
	Functional prepuberal castrates.....	8	36	86
	Seminiferous tubule failure.....	20	74	80.7
Experimental groups	Psychoneurotic males.....	15	25	13.3
	Male climacterics.....	23	109	61.8

* All these subjects were proved to have testicular failure by microscopic examination of a testicular biopsy specimen taken in each instance.

tropic hormones, one capable of stimulating the growth of ovarian follicles in the female or seminiferous tubules in the male (follicle stimulating hormone), the other capable of producing luteinization in the female or of stimulating the interstitial cells of the male (luteinizing hormone).

Further evidence for the direct correlation between gonadotropic titers and testicular function was obtained in 6 patients on whom gonadotropic assays were performed before castration and one month or more after castration. The preoperative titers were normal, the average ovarian weight of assay rats being 12 mg. This was interpreted as indicating normal testicular function. Microscopic examination of the ablated testes showed them to have normal structure, which confirmed the impression that these men had normal testicular function preoperatively. The gonadotropic titers after castration were high, the average ovarian weight of assay rats being 58 mg. The elevation of gonadotropins is probably due to failure of utilization by the ablated testes, which normally metabolize this hormone. Therefore the rise of gonadotropins is interpreted as a reflection of testicular failure.

Functional Prepuberal Castration in Men.—Elevated gonadotropins were also observed in cases of spontaneous prepuberal destruction of the testes. This was seen in 8 cases in which operation revealed either the absence or the complete atrophy of the testes associated with wolffian duct derivatives in the scrotum (chart 1 and table 1).

Hyalinization of Seminiferous Tubules and Clumping of Leydig Cells.—From a third type of primary failure of the testes we obtained additional corroboration of the fact that when the testis fails, in the absence of pituitary disease, there is always a compensatory rise in urinary gonadotropins. In this syndrome, only recently described by Klinefelter, Reifenstein and Albright¹⁰

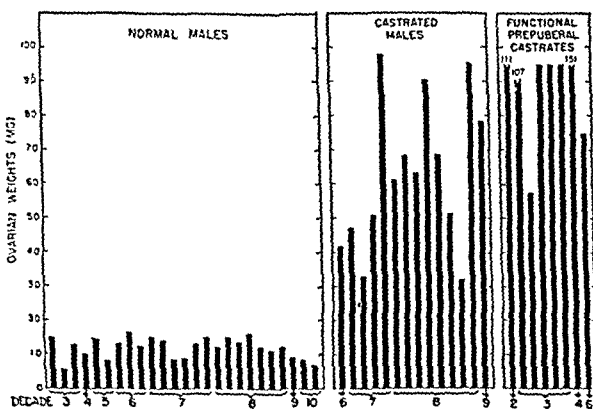


Chart 1.—Urinary gonadotropic titers.

the weight of the ovaries of the assay rats (table 1). The average ovarian weight of rats injected with concentrates of urine from castrate males was 62.6 mg.,

7. Heller, C. G., and Chandler, R. E.: Gonadotropic Hormone Modification of the Alcohol Precipitation Assay Method, *J. Clin. Endocrinol.* 2: 252-253 (April) 1942. Heller, C. G.; Lawson, H., and Sevringhaus, E. L.: The Immature Rat Uterus as an Assay End Point for Gonadotropic Substances, *Am. J. Physiol.* 121: 364-378 (Feb.) 1938.
8. The titers for the normal males in this series compare favorably with the low titers established for normal males by Heller, E. J.; Heller, C. G., and Sevringhaus, E. L.: Gonadotropic Hormone: Assays of Human Male Urine, *Endocrinology* 29: 1-7 (July) 1941.

9. Heller, C. G.; Nelson, W. O., and Roth, A. A.: Functional Prepuberal Castration in Males, *J. Clin. Endocrinol.* 2: 573-588 (Nov.) 1943.

10. Klinefelter, H. F., Jr.; Reifenstein, E. C., Jr., and Albright, F.: Syndrome Characterized by Gynecomastia, Aspermatogenesis Without A-Leydigism and Increased Excretion of Follicle Stimulating Hormone, *J. Clin. Endocrinol.* 2: 615-627 (Nov.) 1942.

and by Heller and Nelson,¹¹ a definite correlation has been established between the hyalinization of the seminiferous tubules, Leydig cell failure and elevated gonadotropins. The elevation of gonadotropins can be seen for 20 of our cases in table 1.

Thus, in every proved case of primary gonadal failure, impaired or absent gonadal function was accompanied by a rise in urinary gonadotropic excretion. The high concentrations of gonadotropins in the urine were in striking contrast to the low titers encountered in normal men of the same age. Therefore it was felt the gonadotropic titer could be safely utilized as a measure of gonadal failure in cases showing symptoms suggestive of the male climacteric.

RESULTS IN MEN WHOSE TESTICULAR FUNCTION WAS UNDER INVESTIGATION

Urinary gonadotropic assays were performed on a series of 38 men, all of whom complained of constitutional and psychic symptoms more or less resembling those of the female menopause. In addition, 32 of the 38 patients complained of impotence. On the basis of the results of the assays, the cases could be sharply

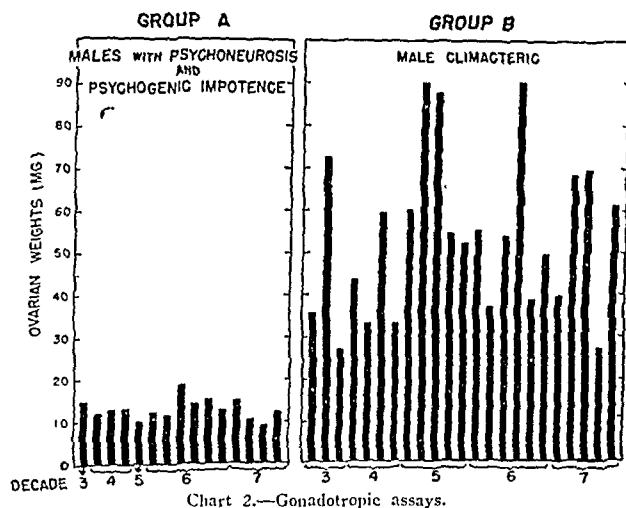


Chart 2.—Gonadotropic assays.

subdivided into two groups, designated temporarily as groups A and B.

A. Normal gonadotropic assays were obtained in 15 of the 38 patients. The average assay ovarian weight was 13.3 mg. for this group of 15 and compared very closely with the figure of 12.3 mg., which was the average assay ovarian weight for the 25 normal males. The striking uniformity of individual cases in the two groups is evident from a comparison of charts 1 and 2. From the fact that the gonadotropic titers of the cases in group A corresponded with those of normal males it was concluded that testicular failure had not occurred.

B. High gonadotropic assays were obtained in 23 of the 38 patients. The titer of each of the 23 cases was unequivocally higher than any titer obtained in the 15 cases in group A or any titer in the 25 normal control cases, as is evident from studying charts 1 and 2. The amount of gonadotropic hormone excreted in these 23 cases corresponded closely to that excreted by the castrated controls. The average assay ovarian weight of the 23 cases in group B was 52.8 mg. as compared with 62.6 mg. for the castrated controls and contrasted

with 12.3 mg. and 13.3 mg. for the normal controls and the 15 cases in group A, respectively. It was concluded that these 23 men in group B had testicular failure.

Testicular biopsies were performed in 8 of the 23 cases in group B as a check on the reliability of gonadotropic assays in predicting testicular failure. Histologic evidence corroborating the presence of testicular failure was obtained in all 8 cases. In 5 instances the biopsies revealed reduction in size and in activity of the seminiferous tubules and reduction in the size and number of Leydig cells. The latter were abnormal in granulation and lipid content. In 3 cases the biopsy findings simulated those of Klinefelter's syndrome¹² and are described in detail by Nelson.¹²

Therapeutic test was applied in 29 cases, including 9 from group A and 20 from group B. The therapeutic test consisted in an evaluation of the clinical response to testosterone propionate¹³ given intramuscularly in doses of 25 mg. five times weekly for two to four weeks.

Results of the Therapeutic Test in the Patients with High Gonadotropins (Group B).—Definite improvement in the symptomatology was noted by the end of the second week in all of the 20 cases treated. Complete abolition of all vasomotor, psychic, constitutional and urinary symptoms (table 2) was accomplished by the end of the third week in 17 of the 20 cases treated. In the remaining 3 cases vasomotor and urinary symptoms were abolished but the psychic and constitutional symptoms persisted despite continuation of treatment for several months and doubling the dosage for brief periods. It was concluded that these three persons were suffering from involutional melancholia. Sexual potency was restored to normal with these doses in all but 2 cases, in 1 of which involutional melancholia was present. With an increase in dosage of testosterone propionate to 50 mg. five times weekly, sexual vigor in both previously refractory cases exceeded that of normal men.

In 14 cases therapy was subsequently withheld for from four to fifteen weeks and in all instances the symptoms returned and sexual potency was again lost. On resumption of the therapy with testosterone propionate, relief from symptoms was again afforded and sexual potency returned. Thus the specificity of therapy was established. To investigate further the possibility that the improvement might have been due to suggestion, placebo injections were administered. Ampules containing 1 cc. of sesame oil, packaged similarly to the original testosterone propionate, were substituted without the patient's knowledge in several cases. No improvement was noted in any case.

In chart 3 a case is presented to illustrate the abolition of symptoms and restoration of potentia by testosterone propionate, the recurrence of symptoms and loss of potency after discontinuance of therapy, the failure of sesame oil placebo and the subsequent control by resumption of androgenic therapy. The results of the therapeutic test provide confirmatory evidence that the symptoms and loss of potentia in the group with elevated gonadotropins (group B) were due to testicular failure.

Results of the Therapeutic Test in the Patients with Normal Gonadotropins (Group A).—Of the 9 men subjected to the therapeutic test 7 had loss of sexual

11. Heller, C. G., and Nelson, W. O.: *Discussion of Relationship of Gonadotropins, Depressed Endocrinol.*, to be published.

Seminiferous Function: Elevated J. Clin.

12. Nelson, W. O., and Heller, C. G.: *Hyalinization of Seminiferous Tubules and Clumping of Leydig Cells: Microscopic Picture in the Testis and Associated Changes in the Breast*, *J. Clin. Endocrinol.*, to be published.

13. The testosterone propionate, free testosterone pellets, solution of methyl testosterone for sublingual use and the methyl testosterone tablets for oral use were furnished by Dr. Max Gilbert of the Schering Corporation, Bloomfield, N. J.

potency and 8 had some of the other symptoms listed in table 2. In 3 instances there was evanescent improvement in symptomatology noted during the first week of therapy. However, by the end of the second to fourth weeks none of the 9 patients demonstrated any improvement whatever in either the general symptomatology or the sexual vigor.

The results of the therapeutic test in the group with normal gonadotropins (group A) provide confirmatory evidence that loss of potentia and symptoms in these patients were not due to testicular failure. This conclusion was corroborated by the fact that normal men experience little, if any, increase in sexual potency or in well being by taking the male sex hormone.

Symptomatology.—By the foregoing objective tests the 38 cases could be sharply separated into two groups: A, consisting of 15 patients having normal testicular function as evidenced by normal gonadotropic excretion and failure to respond to the therapeutic test; B, consisting of 23 patients having testicular failure as evidenced by high gonadotropin output, comparable to castrates, histologic evidence of testicular degeneration and specific response to the therapeutic test.

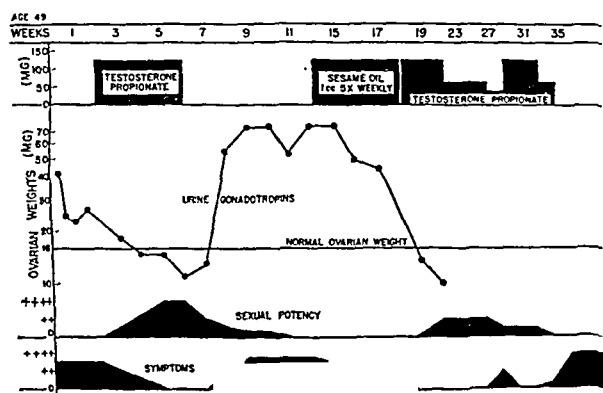


Chart 3.—Therapeutic test.

Symptoms Encountered in the Group with Testicular Failure.—After the symptoms of the group with elevated gonadotropins were analyzed it was evident that they fell into five categories: (1) vasomotor, (2) psychic, (3) constitutional, (4) urinary and (5) sexual. The various symptoms classified in this manner are listed in table 2.

The urinary frequency and hesitancy and decrease in size and force of the stream are undoubtedly related to enlargement of the prostate and decreased bladder tonus which accompany testicular failure. The urinary symptoms are relieved by testosterone, in all probability, because of improvement of bladder tonus, not because of any direct effect on the prostate.

The vasomotor, psychic and constitutional symptoms are identical with those encountered in the female menopause. Of course, no patient exhibited all of the symptoms listed. The most constant symptom was the loss of sexual potency, which was a complaint of all 23 patients. This was usually but not invariably accompanied by loss of libido. Psychic and constitutional symptoms, particularly nervousness and fatigability, were also invariably present. A somewhat less frequent but more characteristic symptom was hot flashes identical with those described by menopausal women. A significant feature from a diagnostic standpoint was

the tendency for loss of sexual potency, hot flashes and nervousness to make their appearance concurrently. While the onset was never fulminant, the patient could usually tell the month or season the symptoms began. The etiologic relationship between the symptoms in table 2 and the testicular failure was borne out by the specific relief afforded by androgens, the recurrence after cessation of androgenic therapy and unresponsiveness to placebos.

Symptoms Encountered in the Group with Normal Testicular Function.—The majority of the men in group A also complained of loss of potency usually accompanied by psychic and constitutional symptoms resembling those of group B and occasionally by vasomotor and urinary symptoms listed in table 2. A notable

TABLE 2.—Symptoms According to Categories

1. Vasomotor:	hot flashes chilliness sweating palpitation increased pulse rate headache
2. Psychic:	nervousness irritability insomnia depression self depreciation antisocial tendencies crying spells suicidal tendencies paresthesias pruritus inability to concentrate
3. Constitutional:	weakness fatigue muscle pains muscle cramps arthralgia anorexia nausea and vomiting abdominal pain constipation weight loss
4. Urinary:	decreased force decreased size frequency hesitancy
5. Sexual:	diminution of libido decreased erections

difference was the rarity of true hot flashes in group A. Often the symptoms had been present for most of the patient's adult life or occasionally had been very abrupt in onset, coincident with some psychic trauma.

COMMENT

At the conception of this investigation four questions were postulated. On the basis of the data presented, an attempt will now be made to answer each question.

1. *Is there an organic basis for justifying the claim that the male climacteric is a true clinical entity?* This is answered in the affirmative by the finding of testicular failure in 23 of the patients studied. The objective evidence for the testicular failure consisted of (a) elevation in gonadotropic excretion, comparable quantitatively with that occurring in castrated males and men with primary gonadal failure; (b) histologic signs of testicular atrophy or degeneration in all eight cases subjected to testicular biopsy. The etiologic relationship between the demonstrated testicular failure and the

clinical picture was borne out by (a) the resemblance of the symptoms of this group of cases to that of the definitely established pattern of the female menopause, with the addition of occasional urinary symptoms and the invariable association of decrease in sexual potency; (b) the specific restoration of potency and alleviation of the menopausal-like symptoms by applying the therapeutic test of substitution therapy with androgens; (c) the reappearance of symptoms after withdrawal of androgens, and (d) the complete failure of placebos.

It was therefore concluded that these 23 patients were true examples of the male climacteric!

2. *Is it possible to distinguish between the male climacteric and psychoneurosis and psychogenic impotence, either clinically or by laboratory methods?* Presumptive differentiation may be made by a careful history combined with a therapeutic test. For a positive differentiation, however, laboratory tests are necessary. The assay of urinary gonadotropins provided a sharp distinction between known normal and known castrated men and an equally clearcut distinction between group A and the male climacterics (group B). By this means it was established that the climacteric patients had testicular failure and that group A did not.

This was further supported by the failure of the patients in group A to respond to the therapeutic test. It was therefore concluded that the symptoms of the patients in group A were not due to testicular failure and that the probable basis for the symptoms was psychoneurosis or psychogenic impotence!

On the basis of clinical symptomatology alone, a tentative but not an absolute differentiation can be made. The most important diagnostic points are: 1. Character of the symptoms: The symptom complex of the male climacteric corresponded much more closely to the female menopause than did the symptom complex of the average psychoneurotic. Typical hot flashes, identical with those occurring in the female menopause, are strongly suggestive of the male climacteric but occasionally may occur in psychoneurosis. On the other hand, the absence of hot flashes by no means excludes the diagnosis of the male climacteric. In fact, this symptom was absent in about 40 per cent of our cases. 2. The mode of onset: The diagnosis of male climacteric is strongly suggested when a past history is obtained of normal sexual function up until a definite month or season, at which time loss of potentia, hot flashes and nervousness appear simultaneously. A diagnosis of psychoneurosis is suggested when the symptoms have been present throughout adult life or are abruptly precipitated by psychic trauma. Often a careful history will uncover the emotional factors responsible for the impotence and symptoms of the neurotic. 3. The therapeutic test will aid in separating the two groups, since the climacterics can be expected to make a striking improvement, whereas the psychoneurotic usually do not show a specific response.

As the study progressed and the differences in the clinical pattern between the climacteric and the psychoneurotic became evident, a large number of the psychoneurotic were eliminated on a clinical basis. This accounts for the fact that 23 of the 38 patients in the series proved to be examples of the male climacteric and that only 15 psychoneurotic patients were investigated by laboratory methods.

3. *What therapy is advisable?* Before instituting treatment it is necessary to establish the diagnosis of the male climacteric and to exclude the following contraindications to androgens: (1) the presence or suspicion of carcinoma of the prostate in particular and any carcinoma in general, since the steroids have a carcinogenic action; (2) the presence of edema, since testosterone tends to produce sodium, and hence water, retention; (3) any case showing normal testicular function, since testosterone will inhibit spermatogenesis in normal males and may, in addition, cause disuse atrophy of the normal Leydig cells. In this connection we have followed the gonadotropic excretion in a normal man given a long course of testosterone propionate therapy and found that after discontinuance of the androgen the gonadotropins rose to levels corresponding to those following castration. Whether these changes are permanent or not is still uncertain, but it is entirely possible that ill advised treatment with testosterone may cause permanent sterility.

Therapeutic Test Suggested for Establishing the Diagnosis of Male Climacteric.—In clinical practice laboratory procedures that will positively differentiate climacteric from psychoneurotic patients may not be available. Although the testicular biopsy is a simple surgical procedure, it may not always be feasible. Under such circumstances it may be necessary to resort to the following therapeutic test: Administer 25 mg. of testosterone propionate by intramuscular injection five days weekly for a period of two weeks. Evaluate the clinical status at that time, noting the effect on symptoms and sexual potency. If, at the end of the two week trial of therapy, the patient has shown no improvement, either of two conclusions may be justifiable: (1) The patient does not have the male climacteric or (2) he will need such an excessively large daily dosage of testosterone that treatment is financially impractical. If the patient does respond it may be necessary to determine whether the improvement is actually due to specific relief of testicular failure or whether it is merely due to suggestion. Withdrawal of therapy until symptoms return and then reinstitution of therapy with placebos may be required to settle the question.

If the diagnosis of the climacteric is positively established by these procedures and the response to the therapeutic test is satisfactory, the minimal dosage for control can next be determined by trial and error. In cases of complete testicular failure, satisfactory control will usually be obtained by administering 25 mg. of testosterone propionate three times weekly. In some cases injection of 25 mg. once a week will suffice. Rarely 10 mg. once or twice weekly may maintain a patient satisfactorily.

In our experience with cases in which a diagnosis of testicular failure has been clearly established, eunuchoids as well as climacteric patients, the use of methyl testosterone has been disappointing both by the oral and by the sublingual routes. The recommended oral dose of four to six times the injection dose was inadequate for satisfactory maintenance. Larger doses often caused nausea and vomiting and were too expensive to be practical. The sublingual use of methyl testosterone, either in solution or in tablet form, is not recommended because it has either been ineffective or

has produced undesirable reactions such as burning of the mouth, swelling of the gums, nausea, vomiting, heartburn, weakness of the legs, tinnitus, vertigo and headache.

If more than two intramuscular injections of testosterone propionate are necessary per week for maintenance effects, it is suggested that pellets of free testosterone be implanted subcutaneously in the thighs through a pellet injector. The implantation of 4 to 8 pellets weighing 75 mg. each will provide excellent control for periods of six to ten months.

4. *Can the average male expect to experience the male climacteric?* We believe not. Our conviction comes from observations of gonadotropic excretion in normal males, examination of testicular tissue removed at orchiectomy for carcinoma of the prostate in aged men, the sexual history of elderly normal men and the bodily configuration and physical examination of elderly men. All indicate that both the germinal and the hormonal function of the testes is preserved well into senility in the average man. Reduction of function is admitted, but fairly adequate maintenance occurs in most cases studied. In addition, it should be noted from chart 2 that the male climacteric is not confined to middle and old age but may occur as early as the third decade. The youngest patient in this series of male climacterics was 25 years of age.

Thus we conclude that, whereas in the female the menopause is an invariable and physiologic accompaniment of the aging process, in the male the climacteric is an infrequent and pathologic accompaniment of the aging process.

The demonstration that testicular failure is responsible for the male climacteric, a syndrome whose clinical manifestations are entirely subjective and easily confused with psychoneurosis, establishes an organic basis and physiologic treatment for a small segment of the large field encompassed by the term psychoneurosis.

SUMMARY

The diagnosis of the male climacteric was established in 23 cases by the finding of pronounced elevation in gonadotropic hormone excretion, comparable quantitatively to that occurring in castrates. This was corroborated in all 8 cases subjected to biopsy by histologic evidence of testicular atrophy and degeneration. The diagnosis was further supported in all 20 cases treated by specific response to a therapeutic test with androgens.

A clearcut differentiation of the male climacteric from psychogenic impotence was made by urine gonadotropic assays, which were decidedly elevated in the former group and normal in the latter. A simple therapeutic test is helpful in distinguishing between these two conditions.

The symptomatology of the male climacteric is different from that of psychoneurosis and psychogenic impotence. Satisfactory therapeutic results were obtained by intramuscular injections of testosterone propionate and by implantation of testosterone pellets but not by the oral or sublingual administration of methyl testosterone.

Although the male climacteric may occur as early as the third decade, it is a relatively rare syndrome, probably affecting only a small proportion of men who live into old age.

RECURRENCE RATES IN RHEUMATIC FEVER

THE EVALUATION OF ETIOLOGIC CONCEPTS AND CONSEQUENT PREVENTIVE THERAPY

MAY G. WILSON, M.D.

AND

ROSE LUBSCHEZ

NEW YORK

The clinical course of rheumatic fever is characterized by frequent recurrence of manifestations of the disease and a varying number of intercurrent years of freedom from symptoms. The average risk for a recurrence of rheumatic fever has never been defined. Current etiologic concepts and consequent preventive therapy are based in large measure on a comparison of the number of recurrences of rheumatic fever among experimental and control groups of rheumatic patients.

The majority of reported studies have been made on small groups of patients. It is rarely possible for any one investigator to assemble a representative series of sufficient size for adequate analysis. Conclusions are frequently drawn from the summated observations of several small but apparently comparable studies.

The pooling of experience is an acceptable practice, provided each study which is included represents a random selection in which experimental and control subjects have been selected alternately. This is essential in order to minimize the possibility of chance being responsible for any observed difference in the two groups. In addition, diagnostic criteria and observations must be uniform, environmental conditions and age constitution comparable. The published studies which have been summated in rheumatic fever do not appear to meet these basic requirements.¹

To obtain a measure of the expected risk of overt recurrence of rheumatic fever, a series of 549 records of a representative group of rheumatic patients was selected for analysis. These patients were under continuous uniform medical supervision in the cardiac clinic.²

METHOD OF ANALYSIS

The usual procedure for constructing a life table was followed, using one person-year of life experience as the unit for study.³ To obtain the rate of recurrence,

These studies were assisted by a grant from the Commonwealth Fund. From the New York Hospital and the Department of Pediatrics, Cornell University Medical College.

Dr. Lowell J. Reed has shown continued interest and given constructive criticism during the progress of these studies.

Read in a symposium on "Rheumatic Fever" before the Section on Pediatrics at the Ninety Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Thomas, C. B. The Prophylactic Treatment of Rheumatic Fever by Sulfanilamide, *Bull. New York Acad. Med.* 18: 509, 1942. Paul.²

2. Only the records of patients whose onset and course of disease were accurately documented were included. In 50 patients the only recurrent attacks were growing and joint pains. These were not included in this presentation. Of the remaining 499 patients, 256 experienced one or more attacks of arthritis or chorea, alone or combined, and in 243 active carditis with or without chorea and arthritis characterized the course. The duration of disease for the age group 4 to 16 years averaged eight years. Within this period, 10 per cent died. In 46.9 per cent mitral insufficiency, in 38.4 per cent mitral insufficiency and stenosis, and in 14.8 per cent mitral and aortic lesions were present. Additional analyses were made for those 345 patients reaching the ages of 17 to 25 years for whom the average duration was an additional six years, and 108 records of rheumatic families including 182 rheumatic individuals were included for the analysis of the influence of environment (Wilson, May G.: *Rheumatic Fever*, New York, Commonwealth Fund, 1940, pp. 225-375).

3. Frost, W. H.: *Papers of Wade Hampton Frost. A Contribution to Epidemiological Method*, edited by K. F. Maxcy, New York, Commonwealth Fund, 1941, p. 586.

the ratio of the number of recurrences to the person-years of life experience at each age from 4 to 25 years was calculated. For 499 patients experiencing a major recurrence (arthritis, chorea and active carditis, alone or combined), age specific rates for different patterns and degrees of severity of the disease were made. In

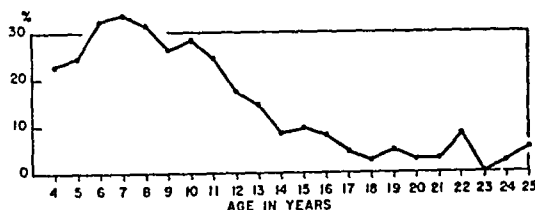


Chart 1—Age specific recurrence rates for 499 rheumatic individuals comprising 5,677 person years

addition, comparison of the recurrence rates in twelve consecutive calendar years from 1924 to 1935 and the rate of recurrence for patients living under relatively favorable and unfavorable environmental conditions were determined.

OBSERVATIONS

Among 499 patients between the ages of 4 and 16 years, representing 3,957.0 person years of life experience, 31 per cent did not have a recurrent major attack. There were 817 recurrent manifestations of arthritis, chorea and active carditis, alone or combined. Among 345 of these patients who reached the ages of 17 to 25 years, representing 1,720.0 person years of life experience, there were 64 major recurrent attacks. Eighty-seven per cent did not have a major recurrence.

AGE SPECIFIC RATES OF RECURRENCE DURING 5,677 PERSON YEARS OF LIFE EXPERIENCE

In table 1 and chart 1 it may be noted that the age specific recurrence rates reflect the natural history of the disease. The rates are highest between the ages of 4 and 13 years, having a peak incidence at about the age of 7 years. After the age of 13 years there is a significant downward trend, which reaches its lowest sustained level after the age of 17 years. The average recurrence rate from 4 to 13 years is 25.0 per cent, from 14 to 16 years the average rate drops to 8.7 per cent and from 17 to 25 years the average recurrence rate is 3.7 per cent. For a random sample between the ages of 4 and 16 years the average risk of recurrence is 20.6 per cent.

The variation in the risk of recurrence at different ages must be considered in selecting patients for study. It is obvious that the age constitution must be com-

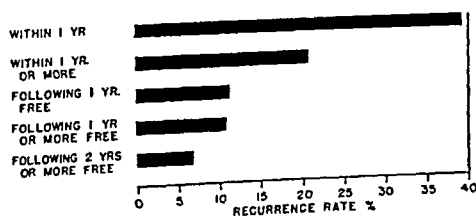


Chart 2—The risk of recurrence in relation to the last rheumatic attack

parable in control and experimental groups. In a small series the presence of only a few patients of a different age in one of the groups might well account for any difference observed.

The interval of time elapsing between recurrent attacks for patients between the ages of 4 and 16 years

was also found to be an important influential factor in the risk of future recurrence. The risk of recurrence during the year immediately following a major episode is 38.7 per cent compared to 11.2 per cent in the year immediately following one year of freedom from recurrence. The average rate of recurrence within one year or more after a major rheumatic episode was twice as great as that following at least one year of freedom and three times as great as that following at least two years of freedom from symptoms, 20.6 per cent, 10.7 per cent and 6.6 per cent, respectively (chart 2 and table 2).

It is generally believed that the incidence of rheumatic fever varies in different years. Analysis of the rate of recurrence in twelve consecutive calendar years from 1924 to 1935 did not reveal any significant difference which could be attributed to epidemiologic factors

TABLE 1—Age Specific Recurrence Rates for 499 Rheumatic Individuals Comprising 5,677 Person-Years

Age	No of Recurrences	Average Person Years	Rate, per Cent
4	16	70.0	22.7
5	30	123.0	24.4
6	61	188.0	32.4
7	85	252.0	33.7
8	96	300.0	31.4
9	94	336.0	26.4
10	112	394.0	28.4
11	102	411.0	24.8
12	72	410.0	17.5
13	59	397.0	14.9
Total 4-13	727	2909.0	25.0
14	31	375.0	8.3
15	33	350.0	9.6
16	26	322.0	8.0
Total 14-16	90	1047.0	8.6
Total 4-16	817	3957.0	20.6
17	13	296.0	4.4
18	7	275.0	2.5
19	12	250.0	4.9
20	6	220.0	2.7
21	6	196.5	3.0
22	14	168.0	8.3
23	3	137.0	2.2
24	3	120.0	2.5
25	3	56.5	5.3
Total 17-25	64	1720.0	3.7

There is a sharp drop in the rates from 1928 to 1931, which reflects the addition to the clinic of a large group of children in whom rheumatic heart disease had been discovered on routine school examination. The elevation in 1932 was due to the transfer to the clinic of patients discharged from the wards following an acute attack of rheumatic fever. It is obvious that in a growing clinic population the different sources from which patients are drawn will influence the average rate of recurrence in the clinic population in any specific year. To prevent erroneous conclusions, it is apparent that data must be inspected for inadvertent bias (chart 3).

It might be expected that the risk of recurrence would vary with the number of previous attacks and the severity of the disease. The rate for the first recurrence after onset was 20.6 per cent. The rate for the second recurrence for those patients who had experienced one recurrence was 18.6 per cent. For those patients who experienced two recurrences the rate for

the third recurrence was 22.1 per cent. It is apparent that the risk for future attacks is not affected by the number of previous recurrences. It was also found that for patients who experienced only arthritis or chorea, alone or combined, the rates were not significantly lower than those observed for children who in

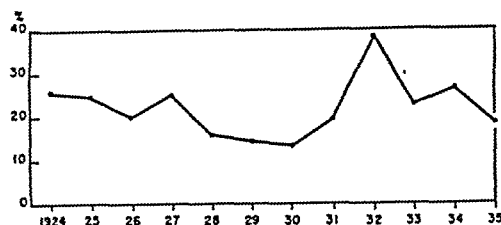


Chart 3.—The rate of recurrence in twelve calendar years (4 to 16).

addition had active carditis, 18.9 per cent and 24.6 per cent, respectively (chart 4).

Unfavorable living conditions are considered to increase the risk of recurrence. It was found that among 59 children living under relatively favorable environmental conditions the rate of recurrence, 22.3 per cent, was not significantly lower than that observed

TABLE 2.—Risk of Recurrence in Relation to Last Rheumatic Attack

Ages	Within 1 Year or More			Following 1+ Years Free			Following 2+ Years Free		
	No. of Recurrences	Average Person-Years	Rate per Cent	No. of Recurrences	Average Person-Years	Rate per Cent	No. of Recurrences	Average Person-Years	Rate per Cent
4-13	727	2209.0	25.0	257	2456.5	11.8	144	2144.5	6.7
14-16	90	1048.0	8.6	65	835.5	7.8	48	759.0	6.3
4-16	817	2957.0	26.6	322	3292.0	10.7	192	2903.5	6.6

Ages	Within 1 Year			Following 1 Year Free		
	No. of Recurrences	Average Person-Years	Rate per Cent	No. of Recurrences	Average Person-Years	Rate per Cent
4-13	441	1105.5	39.9	142	1274.5	11.1
14-16	24	97.0	24.7	18	160.0	11.3
4-16	465	1202.5	38.7	160	1434.5	11.2

for 123 patients living in a more unfavorable environment, 26.0 per cent (chart 5).

The recurrence rates which have been presented may be used to determine the number of recurrences which should be expected in a random sample of rheumatic patients. It is to be emphasized that the two factors which were found to influence the risk of recurrence at any specific time are the age constitution of the group and the interval of time elapsing since the last attack.

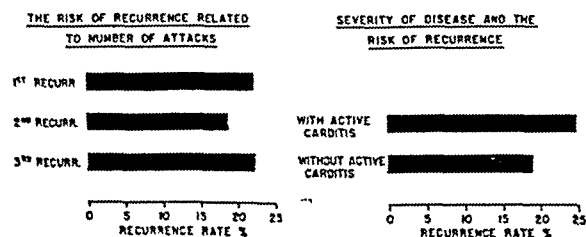


Chart 4.—At left, the risk of recurrence related to the number of attacks. At right, severity of disease and the risk of recurrence.

RECURRENCE RATES IN THE EVALUATION OF PUBLISHED STUDIES

In the majority of recent studies of the relative frequency of rheumatic fever in special groups, attempts have been made to control the observations. However, rarely have alternate experimental and control patients

been selected. It is a common practice to introduce a selective bias by including patients in the control series who are uncooperative, refuse treatment or are dropped from the experimental group for various reasons. In some studies, patients are shifted back and forth from experimental group to control group. Frequently patients are matched for severity of disease or the number of previous attacks. The interval of time elapsing between attacks has not been considered. In many studies the experimental and control groups are not comparable because of differences in age constitution and number of patients. In the majority of the published reports the groups are too small, and conclusions have been based on summated observations.

Although selective factors and inadvertent bias were probably present in the published studies, an attempt was made to compare the number of recurrences expected and observed in the experimental and control groups of six published studies. It was not possible to apply our rates specifically for each age or for varying time intervals in every instance. As far as the data presented could be interpreted, appropriate average rates were applied.⁴ It would be expected that the number of recurrences observed in the control groups would be in close agreement with the number expected, while in the treated groups the number expected would be significantly greater than the number observed. It was found that in the five experimental groups receiving chemotherapy the observed number of recurrences was not significantly lower than expected, with one exception. In

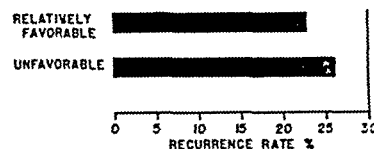


Chart 5.—Relation of environment to the rate of recurrence.

four studies the observed incidence in the control groups was significantly higher than expected, indicating selective or inadvertent bias. The results of this analysis indicate that conclusions as to the efficacy of chemotherapy cannot be drawn from any of these individual studies nor can the results of several studies be summated.

The reported frequency of rheumatic recurrences following hemolytic streptococcus infection is the basis for the prophylactic administration of sulfonamide drugs to rheumatic individuals. The incidence of rheumatic recurrences following hemolytic streptococcus infections ranges from 0 to 82 per cent in the various published studies.⁵ In Kuttner's⁶ large series of rheumatic patients who were under careful observation in a closed colony, only 28 per cent of the children who experienced hemolytic streptococcus respiratory infection had a subsequent rheumatic recurrence.

It is probable that in a clinic population the majority of the children experience hemolytic streptococcus infec-

4. Feldt, R. H.: Sulfanilamide as a Prophylactic Measure in Recurrent Rheumatic Infection. A Controlled Study Involving 131 "Patient Seasons." *Am. J. M. Sc.* 207:483, 1944. Hansen, A. E.; Platou, R. V., and Dwan, P. F.: Prolonged Use of Sulfonamide Compound in Prevention of Rheumatic Recurrences. Evaluation Based on Four Year Study on Sixty-Four Children. *Am. J. Dis. Child* 64:963 (Dec.) 1942. Kuttner, A. G., and Rejersbach, G.: Prevention of Streptococcal Upper Respiratory Infections and Rheumatic Recurrences in 131 Children by Prophylactic Use of Sulfanilamide. *Am. J. Dis. Child* 77:1943. Thomas, C. B.; Francis, R., and Sulfanilamide in Patients Susceptible to Rheumatic Fever. *Am. J. Dis. Child* 116:551 (Feb. 15) 1941. Dodge, M. W.: The Prophylactic Use of Sulfanilamide in the Prevention of Rheumatic Fever. *J. Pediatr.* 2:483, 1944. Kuttner, A. G.: The Epidemiology of Rheumatic Fever, ed 2, New York, Metropolitan Life Insurance Company, 1943, p. 35.

6. Kuttner, A. G.: Prevention of Rheumatic Recurrences: A Discussion of Various Measures Now Being Used, *New York State J. Med.* 43:1941, 1943.

tion during the season of maximum prevalence of rheumatic fever. If it is assumed that rheumatic recurrences are always preceded by a hemolytic streptococcus infection our recurrence rates may be considered to reflect this hypothesis. When these recurrence rates are applied to a group of rheumatic patients all of whom

COMMENT

The expected rate for a major manifest recurrence of rheumatic fever as defined in these studies should be useful in evaluating observations on comparable groups of rheumatic patients.

Of particular importance is the observation that the rate of recurrence varies significantly with age and the interval of time elapsing since the last attack.

The number of attacks or the severity of the disease did not seem to influence the risk of recurrence.

To avoid selective bias, alternate experimental and control cases should be included for study. To prevent inadvertent bias, the age distribution of experimental and control groups should be comparable and the periods between attacks for the two groups uniform. Such bias in a small series might be responsible for any difference observed.

SUMMARY

1. The average over all risk for a major recurrence of rheumatic fever is 25.0 per cent for patients between the ages of 4 and 13 years, 8.6 per cent for patients between the ages of 14 and 16 years and 3.7 per cent for patients between the ages of 17 and 25 years. The average over all risk for children from 4 to 16 years of age is 20.6 per cent for a major recurrent attack.

2. The over all risk for a major recurrence of rheumatic fever is two to three times greater in any year following an attack than the risk following one or two or more years of freedom from activity, i. e. 20.6 per cent, 10.7 per cent and 6.6 per cent respectively.

3. The risk for the year immediately following an attack is 38.7 per cent in comparison to 11.2 per cent in the year immediately following one year of freedom from a recurrence.

4. The recurrence rate is not significantly different for patients experiencing one, two or three recurrent attacks, i. e. 22.3 per cent, 18.6 per cent and 22.1 per cent respectively.

5. The recurrence rate is not significantly different in patients experiencing arthritis and chorea, with or without active carditis. The severity of the disease did not appear to influence the risk of recurrence.

6. The rate of recurrence in twelve consecutive calendar years, from 1924 to 1935, was not significantly different when sampling factors were not operative.

7. The risk of recurrence is not significantly different among children living under relatively favorable and unfavorable environmental conditions.

CONCLUSIONS

The expected risk for a major recurrence of rheumatic fever at specific ages from 4 to 25 years and for various patterns of disease was defined from the analysis of the records of 499 rheumatic individuals during 5,677 person-years of life experience.

The only factors which were found to influence the risk of future recurrences were age and the interval of time elapsing since the last attack.

Most published studies on the relative frequency of rheumatic fever in experimental and control groups do not appear to meet the basic requirements for adequate biostatistical analysis. Final judgment as to the validity of etiologic concepts and consequent preventive therapy, which are based on these studies, must be deferred.

525 East Sixty-Eighth Street.

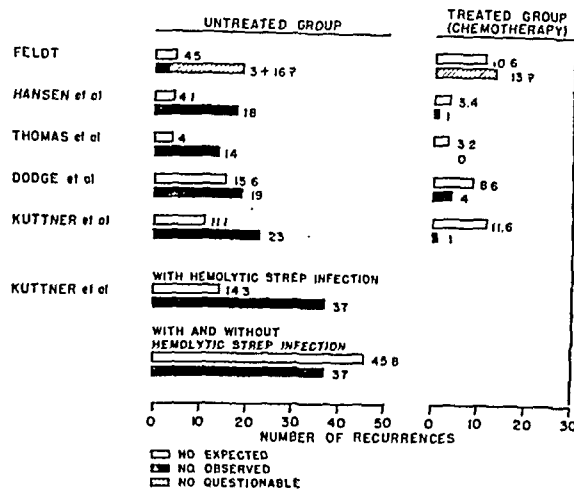


Chart 6.—Evaluation of published studies on the frequency of rheumatic recurrences.

had hemolytic streptococcus infections, there should be close agreement between the number of recurrences expected and observed. However, it was found in Kuttner's series of patients, all of whom had hemolytic streptococcus infections, that the number of recurrences observed was significantly greater than the number expected. It is significant that when the rates were applied to Kuttner's total series, in which two thirds

TABLE 3.—Recurrence Rates in the Evaluation of Published Studies

	Control				Treated			
	No. of Cases	Rate of Ap-plied	No. of Recurrences Ex-pected	Ob-served	No. of Cases	Rate of Ap-plied	No. of Recurrences Ex-pected	Ob-served
Feldt.....	42	10.7	4.5	3+167	99	10.7	10.6	13?
Hansen, et al.....	38	10.7	4.1	18	32	10.7	3.4	1
Thomas, et al.:								
7-13 years.....	3	25.0	0.7	..	2	25.0	0.5	..
14-19 years.....	39	6.3	2.4	7	29	6.3	1.8	..
20-29 years.....	12	3.7	0.4	2	15	3.7	0.6	..
30-37 years.....	13	3.7	0.5	5	9	3.7	0.3	..
Total.....	67	....	4.0	14	55	....	3.2	(1)
Dodge, et al.:								
Under 14 years.....	93.9	11.8	11.1	..	56.3	11.8	6.6	..
14-20 years.....	7.1	6.3	4.5	..	31.7	6.3	2.0	..
Total.....	101	....	15.6	19	88	....	8.6	4
Kuttner, et al.....	104	10.7	11.1	23	108	10.7	11.6	1
Kuttner, et al.:								
With and without hemolytic streptococcus infections....	428	10.7	45.8	37				
With hemolytic streptococcus infections.....	134	10.7	14.3	88				

of the group did not have hemolytic streptococcus infections, there was close agreement between the number of recurrences expected and observed. Conclusions as to the role of hemolytic streptococcus infections in precipitating rheumatic recurrences cannot be drawn from these data.

THE DIAGNOSIS OF RHEUMATIC FEVER

T. DUCKETT JONES, M.D.
BOSTON

Numerous factors slowly accruing over the years have resulted in focusing our attention on the problem of rheumatic fever. This would seem logical in view of the fact that it remains one of the important soluble medical problems of our day. Increase in fundamental knowledge of the disease probably accounts for the major increase in interest, along with acceptance by an increasing number of physicians of the public health or community aspects of the disease. Recently small public programs of care have been developed in some states by the Children's Bureau of the U. S. Department of Labor. The legislative authority for such programs has been made possible by federal grants in aid to the states under title V of the Social Security Act. These carefully worked out care programs, along with extensive professional and lay education by many agencies, have played a pioneer role in the stimulation of general interest.

A more immediate stimulus has been the appearance of rheumatic fever among the armed forces in such volume as to constitute a serious medical problem. Epidemiologic data now beginning to appear in the literature indicate that rheumatic fever in the services would seem to be closely associated with epidemics of beta-hemolytic streptococcus infections. Thus, data in the literature on the recurrences of rheumatic fever, especially epidemics of recurrent rheumatic fever in known rheumatic fever and heart disease populations, are found to be pertinent and duplicated in populations of unknown rheumatic fever susceptibility, even in adult age groups. These data are based on reasonably sound observations, since clinical histories or observed illnesses, bacteriologic findings and the results of immunologic tests indicate a close association between rheumatic fever and preceding respiratory infection with beta-hemolytic streptococci, and with cognizance of the many unknown factors and varying elements of susceptibility on the part of the individual. This information offers a rational basis for the development of programs of prevention and care.

Programs of prevention and care (at least at study levels) are hence not only desirable but inevitable and will be insisted on by an informed public. It is therefore fitting that a National Rheumatic Fever Council is in the process of formation, the joint purpose of which is to advocate the extension of public programs of prevention and care, with essential private agency or individual stimulation of study programs and the conducting of studies designed to increase our basic scientific knowledge of the disease.

Despite our increase in knowledge of rheumatic fever, no specific diagnostic test has been forthcoming. This is a distinct deterrent to the advancement of the problem. From the study of the medical literature it is obvious that each observer has his own diagnostic criteria and that these may differ widely. For several reasons the importance of rather strict diagnostic criteria would seem essential at this time, and these may be enumerated as follows:

1. Otherwise the incidence of rheumatic fever may be interpreted as varying greatly whether the data are

collected by surveys, the development of a rheumatic fever register, making the disease reportable, or the study of hospital records.

2. The interpretation of study programs of prevention and care is obviously dependent on such diagnostic criteria.

3. The professional and lay educational programs to date have overemphasized the serious implications of such a diagnosis, so that there is danger in producing often unnecessary and at times violent emotional and psychologic suffering among patients and parents if too liberal criteria are accepted. Granted, incidence figures may be altered inadvisedly. Nevertheless, until diagnostic measures become more specific, prognostic implications altered and reeducation conducted on this basis, there seems little doubt but that we may produce a not inconsiderable number of psychologic cripples. This feature is of especial pertinence to the armed forces.

Hence it is not surprising that the Subcommittee on Cardiovascular Diseases of the National Research Council, interested in the varied aspects of heart disease in relation to the war, has requested a reiteration of the diagnostic criteria of rheumatic fever.

With the understanding that diagnostic criteria must be subject to change as knowledge increases and that for the present it is inadvisable to accept the diagnosis without reasonable assurance of certainty, the various features may be discussed briefly under two headings: the clinical syndrome and the development of rheumatic heart disease. Under these headings one may discuss any feature relative to rheumatic fever, past or present. Some additional features will be mentioned under differential diagnosis and comment.

THE CLINICAL SYNDROME

Major Manifestations.—These manifestations offer the least likelihood of an improper diagnosis. Disagreement would seem to exist largely in the relative importance of the individual manifestations. Few if any clinicians would disagree as to the diagnosis in an acutely ill person presenting a combination of these major manifestations. In only three clinical syndromes is there often any confusion with such a combination of findings. Two of these are relatively rare, while the third is common. They are Still's disease (in children), disseminated lupus erythematosus and the acute form of rheumatoid arthritis. Occasionally long observation is necessary to differentiate these from rheumatic fever, and one must constantly bear them in mind when seeing an acutely ill patient.

1. *Carditis.* Since active carditis is found in all fatal rheumatic fever cases¹ it may be listed as the first major manifestation. Numerous evidences may be found of definite structural or functional cardiac change during acute rheumatic fever. Knowledge of the heart findings prior to the onset is often of prime importance. Incontrovertible evidence of active carditis may be accepted if the patient develops definite cardiac enlargement, significant cardiac murmurs, pericarditis (friction rub) or congestive failure. This would seem to hold at any age if other major manifestations exist. They are at times overlooked in the older patient. In the young patient these findings are usually indicative of rheumatic fever despite the absence of polyarthritis, and, indeed, in children such a clinical picture is not unusual. Doubt will certainly be raised concerning what comprises a significant murmur. It is beyond the scope of this

From the House of the Good Samaritan.
Read in a symposium on "Rheumatic Fever" before the Section on Pediatrics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Bland, E. F., and Jones, T. D. Fatal Rheumatic Fever. *Arch. Int. Med.* 61: 161 (Feb.) 1938.

report to present the subject in detail. However, a loud, long, apical systolic murmur, widely heard and not varying with position, may be considered significant, as well as any type of diastolic murmur. It is entirely advisable to adhere to the classification and interpretation of heart findings as delineated in the "Nomenclature and Criteria for Diagnosis of Diseases of the Heart" (New York Heart Association, 1940).

Electrocardiographic changes may be demonstrated in many patients if repeated tracings are made. Prolongation of auriculoventricular conduction time (varying limits depending on the age of the patient) is the most frequent finding, but numerous other changes may be encountered (such as inversion of T waves, transient changes in electrical axis during failure, and so on). Cohn and Swift² state that as high as 95 per cent of these patients may show changes. Such changes are noted less frequently in children. While prolongation of the PR interval may be supracardiac in origin (Keith³), the presence of other symptoms make it highly suggestive of carditis, and it is often a diagnostic aid. Various arrhythmias (such as auricular fibrillation) may likewise be found during the acute illness. Sinus tachycardia is usually proportionate to other evidences of illness (carditis, fever and the like), and as a single manifestation it is rarely helpful. Struthers and Bacal⁴ rightly point to the value of the sleeping pulse rate over that of the waking rate.

2. Arthralgia. Migrating polyarthritis is generally considered the classic feature of rheumatic fever. While it is common, especially in the young adult patient, no one symptom offers greater diagnostic difficulty, whether the joint changes are objective or mere subjective complaints. One must remain skeptical where this is the only real clinical finding aside from fever. The diseases are legion in which varying degrees of arthralgia are encountered. It is therefore advisable to search frequently for some evidence of carditis and other major and (as is common) minor rheumatic fever manifestations before accepting arthralgia as being proof of the existence of rheumatic fever. In my experience transient mild polyarthritis, without other diagnostic features suggestive of rheumatic fever or some other medical condition, rarely proves to be a problem of serious import. One must accept, I feel, one exception to this. Knowledge of the epidemiologic disease pattern of the community in which the disease develops may present strong presumptive evidence of rheumatic fever. For instance, if the patient has been exposed to a known beta-hemolytic streptococcus or scarlet fever epidemic, any joint symptoms become more significant. If the patient has had tonsillitis, pharyngitis or even a cold in the past two or three weeks, and serologic tests (such as antistreptolysin determination) indicate a recent hemolytic streptococcus infection, the burden of proof rests with the physician who would not interpret such a syndrome as rheumatic fever, since this represents the usual epidemiologic pattern of the disease. However, in the absence of such findings and other rheumatic fever manifestations, arthritic symptoms should not be considered certain proof of the existence of the disease. Some of the medical diseases to be considered in such circumstances will be given later.

3. Chorea. While chorea is a symptom complex, it is closely related to rheumatic fever. In our experience⁵ about one half of all rheumatic fever patients (young patients) have chorea at some time. Conversely, approximately three fourths of our young chorea patients in time develop other major manifestations of rheumatic fever. This would seem closely to associate the two, and it is a rather satisfying relationship from a diagnostic point of view. Since chorea is rarely seen after adolescence, it is not usually helpful with the diagnosis in adults. However, an occasional adult with questionable rheumatic fever findings give a history of childhood chorea. The presence of definite chorea, associated with questionable signs and symptoms, helps establish a definite diagnosis of rheumatic fever.

4. Subcutaneous Nodules. While such nodules are characteristic, they rarely occur in the early stage of the acute illness, and in a large percentage of instances abundant evidence of carditis exists. Hence, only in rare patients are they helpful from a diagnostic point of view, but more often in the determination of the presence of active rheumatic fever in a person with known previous rheumatic fever or rheumatic heart disease.

5. Recurrences of Rheumatic Fever. Perhaps no feature of rheumatic fever is more striking or more important than the tendency of the disease to recur. Perhaps also no more serious aspect as to prognosis exists. A history of previous definite rheumatic fever or rheumatic heart disease is strong evidence of the existence of the active rheumatic fever in the presence of even mild signs and symptoms. In our experience⁶ about 70 per cent of a series of young rheumatic fever patients had recurrences of the disease within ten years of the onset (the majority within five years), while Roth, Lingg and Whittemore⁷ noted 68 per cent with recurrences in their series.

In summary, a combination of these major manifestations makes a diagnosis of rheumatic fever reasonably certain. One must realize that even with this criterion a statistically small number of cases will prove to have been incorrectly diagnosed, after long clinical observation.

Minor Manifestations.—Since the histologic changes are generalized, it is not surprising that the signs and symptoms are varied. Almost any complaint may be a part of the disease pattern; however, a limited number occur often enough and of such apparent significance as to warrant diagnostic consideration. These may be mentioned with varying degrees of emphasis:

1. Fever. A definite elevation of the body temperature is one of the most common and most variable findings in rheumatic fever. Fever alone, even in the presence of laboratory abnormalities, is insufficient to make a diagnosis of initial rheumatic fever. At the present time fever alone (or often in the presence of an extracardiac or so-called functional murmur) is a common erroneous basis for a diagnosis of rheumatic fever. While fever is helpful, it may be misleading, and other features are usually more important.

2. Abdominal Pain. A frequent occurrence is abdominal pain, the exact cause of which is yet undetermined. Many explanations have been offered. Its occurrence is frequent during evident active rheumatic fever. Of particular interest is the frequency with which it is the initial symptom. This is usually clinically indistinguish-

2. Cohn, A. E., and Swift, H. F.: Electrocardiographic Evidence of Myocardial Involvement in Rheumatic Fever, *J. Exper. Med.* 39:1 (Jan.) 1924.

3. Keith, J. D.: Overstimulation of the Vagus Nerve in Rheumatic Fever, *Quart. J. Med.* 7:29 (Jan.) 1938.

4. Struthers, R. R., and Bacal, H. L.: Determination of the Activity of Rheumatic Infection in Childhood, *Canad. M. A. J.* 29:470 (Nov.) 1933.

5. Jones, T. D., and Bland, E. F.: Clinical Significance of Chorea as a Manifestation of Rheumatic Fever, *J. A. M. A.* 105:571 (Aug. 24) 1935.

6. Bland, E. F., and Jones, T. D.: To be published.

7. Roth, I. R., Lingg, C., and Whittemore, A.: Heart Disease in Children, *Am. Heart J.* 13:36 (Jan.) 1937.

able from acute appendicitis. I know of no accurate differential feature at this time. It is not unusual for other rheumatic symptoms to occur shortly after the removal of a normal appendix. This may pose a difficult diagnostic problem in known rheumatic individuals. It may be well to state that, since actual acute appendicitis may occur in rheumatic fever patients, decisions as to the need for operation are not easy.

3. Precordial Pain. While this is a common symptom, evidence of carditis is usually found when it is significant. At times precordial pain may suggest coronary involvement. One must remember, however, that mild or transient precordial pain is one of the commonest symptoms of neurocirculatory asthenia, even in the presence of definite heart disease.

4. Rashes. While many rashes have been described in rheumatic fever, it has been my experience that erythema marginatum is by far the most significant cutaneous manifestation. The evidence at hand rather suggests that it might be more properly classified as a major manifestation of rheumatic fever. Further study is needed on this score. Various purpuric manifestations do occur, but they are apparently less frequent than in the past.

5. Epistaxis. Nontraumatic nosebleeds are common in rheumatic fever. They appear to be less severe and less frequent than a decade ago. Their relationship to rheumatic fever is on a clinical basis as yet. In association with other findings they may be useful in the diagnosis.

6. Pulmonary Findings. During acute rheumatic fever various pulmonary changes are not unusual (even consolidation). The clinical and histologic patterns vary considerably. Without other evidence of rheumatic fever, pulmonary changes are rarely diagnostic. In view of their variability, it is advisable to list them as being of minor diagnostic significance.

7. Laboratory Findings. Since at the present time all laboratory abnormalities found in rheumatic fever are nonspecific in character, they are best listed as being of minor significance. The probable more pertinent implication of electrocardiographic abnormalities have been previously mentioned. The development of a microcytic anemia (severe in only a small percentage of patients), an elevated white blood count and an increase in the sedimentation rate of red blood cells are the most common abnormalities. The latter is perhaps the most useful. These tests are of more pertinence in evaluating the presence of active rheumatic fever (in a known rheumatic individual) than is a diagnostic aid. Occasionally rheumatic fever may be active without these laboratory abnormalities. Of especial interest is the frequent normal sedimentation rate in the presence of heart failure.

Numerous other signs and symptoms are encountered. They occur frequently in other diseases or conditions as well as in rheumatic fever. In my opinion they should not be considered as diagnostic aids in the absence of other abnormalities. The more common of these findings are fatigue, pallor, sweating, loss of weight, headache, vomiting (even cyclic), hematuria (more often microscopic than gross), bursitis and pleuritis (friction rub).

In summary, it may be stated that even a combination of these minor manifestations may not be sufficient to make a certain diagnosis of rheumatic fever, although they may be suggestive. It is further suggested that any single major manifestation with at least two of the minor manifestations would seem to place the diagnosis

on reasonably safe grounds. The most common basis for a mistaken diagnosis with acceptance of this criterion would be the occurrence of some degree of arthralgia in the presence of fever and some laboratory abnormality. Here the history of a previous respiratory infection, exposure to a hemolytic streptococcus epidemic and/or the development of hemolytic streptococcus immune bodies would be a helpful and probably conclusive positive aid.

THE DEVELOPMENT OF RHEUMATIC HEART DISEASE

The presence of heart disease of the rheumatic type does not in itself indicate active but previous rheumatic fever. The indications of carditis listed previously are necessary for this interpretation. Rheumatic heart disease (especially mitral stenosis) often develops insidiously. Until we have a diagnostic test for rheumatic fever, the presence of rheumatic heart disease will continue to play an important role in evaluating the disease. The chief ways in which this is helpful may be listed as follows:

1. Minor manifestations of rheumatic fever in the absence of other causation are presumptive evidence of rheumatic fever (even initial) if the patient has rheumatic heart disease.

2. Knowledge of the period in which rheumatic heart disease develops (by previous known normal examination) would clearly indicate a diagnosis of rheumatic fever (mild and even subclinical) during that time. This is helpful in some epidemiologic studies and will doubtless aid in the more certain evaluation of diagnostic criteria.

In the absence of other causation the minor manifestations of rheumatic fever assume increased diagnostic importance in the presence of definite rheumatic heart disease.

DIFFERENTIAL DIAGNOSIS

Time and space do not permit extensive discussion of the differential diagnosis from other individual diseases. Both major and minor manifestations of rheumatic fever occur frequently in other diseases. One must constantly search for clinical and laboratory indications of other diagnoses. The diseases presenting confusion vary considerably. Experiences would differ between pediatricians and those caring for adults. The varied incidence of disease geographically alters the frequency with which some diseases may be confused with rheumatic fever. In a recent comparison of hospital admission and discharge diagnoses Hansen⁸ pointed out that in a distinct majority there was a close agreement. In his group of children abdominal pain simulating appendicitis offered the most common difficulty. Other incorrect admission diagnoses were (in order of frequency) poliomyelitis, osteomyelitis, varied dermatoses and nephritis. It has been previously pointed out that Still's disease, disseminated lupus erythematosus and rheumatoid arthritis must constantly be borne in mind, the last named being the most frequent difficult differential condition in adult patients. It may be pointed out that rheumatic fever and rheumatoid arthritis coexist in a small number of patients. It is surprising that two such common diseases occur so rarely in the same patient. The possible relationship between these two diseases needs further clarification. Months or even years may be required for a definite differential diagnosis. Malingering may present a problem in diagnosis.

Other confusing diseases may be mentioned: tuberculosis, undulant fever, meningococcal septicemia, forms

8. Hansen, A. E.: *Diagnosis of Rheumatic Fever*, J. A. M. A. 121: 997 (March 27) 1943.

of arthritis other than rheumatoid (especially gonococcal arthritis), gout, and even coccidioidomycosis (in limited areas). No attempt has been made to make this list exhaustive.

COMMENT

As already noted, it would seem logical to make a positive diagnosis on rather strict criteria. Until the etiology of rheumatic fever is known or there is a specific diagnostic test, some confusion is inevitable. We may develop more intelligent criteria with careful clinical observations. For instance, the recent syndrome described by Kaiser⁹ may prove to be rheumatic fever, though he has rightly warned against such definite acceptance as yet. The development of rheumatic heart disease by any appreciable percentage of members of the armed services having mild, and even transient, suggestive rheumatic fever symptoms may lead to the more liberal interpretation of possible rheumatic fever symptoms.

The problem of a hereditary susceptibility is also of importance. The high familial incidence of rheumatic fever and susceptibility on the basis of history may and should heavily weigh the interpretation of suggestive manifestations. One hesitates as yet to use this aid for general diagnostic purposes. Recently DeLee, Dodge and McEwen,¹⁰ using polyarthritis as the common clinical feature in comparing children and adult groups, found that residual rheumatic heart disease at the time of hospital discharge was much lower in adults than in children. The elimination of all save one major manifestation as the basis of selection of cases for analysis may lead to false conclusions. It is difficult to evaluate such a varied clinical syndrome as rheumatic fever on the basis of a single sign or symptom. While many observers feel that heart disease is less common in adults with rheumatic fever than in children, it has been my experience that rheumatic heart disease is common to the two groups and without great discrepancy as to incidence.

There has been a strong tendency to consider a satisfactory response to salicylate as a diagnostic aid. The recent revival of interest in salicylate therapy with massive dosages (Coburn¹¹) renews this possibility. One may state that the clinical course of various diseases may be altered to some degree by salicylates. Until additional evidence is forthcoming the amelioration of signs and symptoms by salicylates in questionable cases would not seem advisable to consider as more than suggestive evidence of a diagnosis of rheumatic fever. The evaluation of the effectiveness of salicylate therapy may be rendered impossible unless strict criteria are used in the selection of patients for such study.

In my experience it has been impossible to differentiate any prerrheumatic state.

SUMMARY

For the present, it would seem advisable to limit the diagnosis of rheumatic fever to patients with rather distinct clinical manifestations. It is suggested that the following constitute reasonably certain diagnostic criteria:

1. Any combination of the major manifestations (carditis, arthralgia, chorea, nodules and a verified history of previous rheumatic fever).

2. The combination of at least one of the major manifestations with two of the minor manifestations (fever, abdominal or precordial pain, erythema marginatum, epistaxis, pulmonary changes and laboratory abnormalities).

3. The presence of rheumatic heart disease increases the diagnostic significance of the minor manifestations, when no other cause for these manifestations exists.

Small though probably insignificant errors may be found with these criteria. Numerous clinical entities as enumerated may be confused with rheumatic fever. Clinical observations and, wherever possible, specific diagnostic tests should be applied in any diagnostic problem.

25 Binney Street.

THE ROLE OF THE CARDIAC CLINIC
IN THE RHEUMATIC PROGRAM

DAVID D. RUTSTEIN, M.D.

NEW YORK

The need for the development of community rheumatic fever programs and the importance of the cardiac clinic in such programs has been supported by many clinical and epidemiologic facts. These include difficulties in the diagnosis of rheumatic disease, the chronic nature of rheumatic disease with its impact on family life, the low economic level in which the disease is most prevalent, the wide prevalence of the disease and the complexity of care necessary for the management of patients.

I should like to discuss these individual factors in more detail. The reasons for the difficulty of diagnosis of rheumatic fever have been adequately summarized in the paper by Dr. T. Duckett Jones.¹ I should like to reemphasize the unknown etiology of the disease, the lack of a specific diagnostic test, and the fact that the diagnosis is frequently dependent on the physician's impression of a group of nonspecific symptoms and signs. I have selected these points since they emphasize the great possibility of error in falsely diagnosing the disease in normal persons and the failure to diagnose the disease in the rheumatic patient. Studies conducted by the Cardiac Bureau of the New York State Department of Health indicated clearly that there was a wide variation, i. e. from zero to 13 per cent in the diagnosis of rheumatic disease by the general practitioner in comparable groups of children.² It is a serious matter not to diagnose rheumatic disease when it exists, but it is to be emphasized that it is an even greater tragedy to apply the rheumatic label to a normal child. The symptoms and signs of rheumatic fever are for the most part nonspecific, and the disease is therefore easily confused with a host of other diseases including tuberculosis, anterior poliomyelitis, functional heart disease, influenza or the grip, undulant fever, acute appendicitis, sickle cell anemia and other febrile diseases and inflammatory joint diseases. Emphasizing the difficulty in diagnosis is the fact that initial examinations of suspected cardiac patients in excellent clinics by experts in rheumatic diseases result in one third of the individuals examined being classified as having pos-

9. Kaiser, A. D.: A Clinical Syndrome in Children Resembling Rheumatic Fever, *New York State J. Med.* **43**: 1937 (Oct. 15) 1943.

10. DeLee, E. M.; Dodge, K. G., and McEwen, C.: The Prognostic Significance of Age at Onset in Initial Attacks of Rheumatic Fever, *Am. Heart J.* **26**: 681 (Nov.) 1943.

11. Coburn, A. F.: Salicylate Therapy in Rheumatic Fever, *Bull. Johns Hopkins Hosp.* **73**: 435 (Dec.) 1943.

From the Department of Health, City of New York. Read in a symposium on "Rheumatic Fever" before the Section on Pediatrics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Jones, T. D.: The Diagnosis of Rheumatic Fever, this issue, page 481.

2. Rutstein, D. D., and Parker, M. E.: Unpublished observations.

sible or potential heart disease;³ i. e. it is not possible in one third of the cases to determine on one examination whether or not rheumatic disease is present. Therefore it is no surprise that the general practitioner with his many other responsibilities cannot be expected to make a final diagnosis of rheumatic disease in many cases.

The chronic nature of rheumatic disease and the familial prevalence of the disease place a great burden on the family. Patients are prone to have recurrent attacks of rheumatic fever and require special care between attacks. Finally the development of rheumatic heart disease imposes crippling and limitation of activity in a large percentage of cases. This indicates a need for vocational training in a sedentary occupation if the patient is to remain self supporting for a long time.

The fact that more than one person in the same family may become afflicted with the disease contributes to the low economic level in which the disease is most prevalent. The low economic level implies poor, crowded and damp housing, poor nutrition and the frequent occurrence of other diseases in the family. If the rheumatic patient is to be properly handled at home, it is obvious that financial support must be given to the family to improve the environment by obviating those factors which predispose to the disease.⁴ In addition to the patient other members of the family will probably benefit from an improved environment, since they are highly susceptible to rheumatic fever. In certain cases foster home and convalescent home services are necessary, and such services must be supplied.

The magnitude of the problem is great. Where surveys have been conducted, from 0.3 to 4 per cent of the childhood population and from 0.6 to 1 per cent of the young adult population have been found to be afflicted with rheumatic heart disease. This is similar to the prevalence of tuberculosis. Another index of the importance of rheumatic fever is the total mortality from rheumatic heart disease, which, as determined by Hedley in Philadelphia,⁵ amounts to approximately 25 to 30 per hundred thousand annually. Swift⁶ has shown that the reported deaths from rheumatic fever and rheumatic heart disease in New York City in 1938 were 1,105 as compared with a combined total of 247 for whooping cough, cerebrospinal meningitis, measles, diphtheria, scarlet fever and infantile paralysis. In other words, in 1938 there were five times as many deaths from this one disease as from a combination of six common reportable diseases in New York City.

It is evident from the foregoing that the care of most rheumatic patients requires more than medical supervision by a physician. Indeed, it involves the cooperation of the medical and nursing services, the hospitals, convalescent homes, foster homes, public and private welfare agencies, the school systems, housing authorities and public health agencies. If complete care is to be provided, careful interrelated planning by all these agencies must be performed. In surveying this complicated problem, it is evident that the focus for such an organization is the cardiac clinic.

I should like to stress the fact that such community organization is not new. The London County Council, long before the present war, developed the London

Rheumatic Scheme,⁷ which provides a model for such organization. In the so-called Rheumatism Section of the London County Council's Rheumatism Scheme, two series of records are kept: first, a register of all proved cases of rheumatic disease and, second, a file by agency of all the facilities that are available in the community for the care of such patients. Such an arrangement interrelates the activities of the agencies and makes possible the referral of the patient to those agencies which are necessary for his proper care. In upper New York State a survey has revealed that when there is no community program there is a great deal of waste and reduplication of effort on the part of many agencies caring for rheumatic patients.⁸ This could be obviated by the establishment of a cooperative community program.

In the organization of such a program the cardiac clinic should provide the following services: diagnostic, follow-up and case finding facilities, a rheumatic register and an educational program for physicians in the diagnosis and treatment of the disease and for nurses and medical social workers in the part they are expected to play in the management of the disease.

The clinic should serve as an aid to the physician by assisting him in the diagnosis and management of his patients. Clinics can be so established as to assure the physician-patient relationship, at the same time providing the patient with adequate care and the physician with constant guidance in the care of his patient. The physician-patient relationship obtains only in a small number of cases, since most of the victims of this disease, in urban areas, fall into the economic group which makes up the usual clinic population. The patients whose diagnoses are verified in the cardiac clinic would be listed in the cardiac register.

The registry system should not be confused with the usual system of reporting a disease. In the former case, that is the registry system, the diagnoses are verified prior to registration. In the case of a reporting system, cases are filed as reported without verification. The difficulties in diagnosis are so great as to make it practically impossible to evaluate information derived from unverified reported cases. There are also practical difficulties in the institution of a requirement for the reporting of a disease which has previously been unreportable. Chief among these is the understandable objection of the practicing physician to the constant increase in the load of clerical work which expanding public health programs demand of him. This objection might be overcome if it could be shown that the information obtained would be of value and that practical benefits in the form of facilities for the care of patients reported would accrue to the practicing physician. The great amount of effort which would be involved in the institution and maintenance of this system of reporting would, however, have to be justified by the type of information obtained. In the light of past experience it is doubtful at present whether the information obtained by the reporting of rheumatic fever and rheumatic heart disease would justify the effort.

In contrast the collection of verified cases under the registry method offers an approach which will provide accurate information. When that information is complemented by a compilation of all available community

3. Cardiac Classification Service, Department of Health, City of New York. Unpublished data.

4. Paul, J. R., and others: *The Epidemiology of Rheumatic Fever and Some of Its Public Health Aspects*, ed. 2, New York, Metropolitan Life Insurance Company, 1943.

5. Hedley, O. F.: *Mortality from Rheumatic Heart Disease in Philadelphia During 1936*, Pub. Health Rep. 52:2, 1937.

6. Swift, H. F.: *Features Which Suggest Public Health Considerations in Rheumatic Fever*, Bull. New York Acad. Med. 16:501, 1940.

7. Thornton, C. E.: *London Scheme for the Treatment and Supervision of Juvenile Rheumatism*, Acta rheumatol. 9:10, 1937. Annual Report of the Council for the Year 1937, London County Council, 1938, vol. 3, pt. 2. Bach, F., Hill, N. G., Preston, T. W., and Thornton, C. E.: *Juvenile Rheumatism in London*, Ann. Rheumat. Dis. 1:210, 1939. Schlesinger, R.: *Public Health Aspects of Heart Disease in Childhood*, Lancet 1:593 and 649, 1938.

resources for the care of the patient, practical results will accrue to the patient and to the private physician.

Studies such as those conducted at the Boston Lying-In Hospital^{7a} indicate that almost half of a group of adults with rheumatic heart disease had no recollection of preexisting rheumatic fever and most of this group did not know that they had heart disease. The results of such studies demonstrate the great need for a case finding service. It is one of the functions of the cardiac clinic to provide a case finding service. Such a service should be begun by an examination of siblings of known cases in the light of the familial prevalence of rheumatic disease recently emphasized by the studies of May Wilson.⁸

The clinic should provide follow-up services since the disease is a chronic one and because approximately one third of the patients referred to the clinic for diagnosis will require repeated examinations before diagnosis can be made. The follow-up facilities would be used for the establishment of the diagnosis in the questionable cases, for the continued care of patients under treatment by the clinic and for continued consultation with the patients of private physicians.

The cardiac clinic should serve as an educational center for instruction in rheumatic fever and rheumatic heart disease for physicians, nurses and medical social workers. The professional education of physicians would be along two lines. A small group of properly qualified physicians should be trained intensively so that they may be able to assist in the clinic and extend clinic service elsewhere. The general practitioner should be trained primarily in the manifold symptomatology of the disease so that he may lower his threshold of suspicion to the presence of the disease. Since the general practitioner must act as the agency for the initial screening of the cases, he should suspect rheumatic fever in any patient with suggestive symptomatology and refer that patient to the clinic for diagnosis. Training in the nursing aspects of rheumatic fever should be provided to graduate nurses so that they may be able to handle their responsibilities in the management of the disease in an intelligent fashion. Medical social workers should also be trained to know their responsibilities when they are called on to direct the medical social aspects of care of the rheumatic patient.

Public educational programs at first should be limited to that necessary to obtain community support. After the program is well established, education of the public in the symptoms and signs of the disease should be carried on in order that patients may be brought under medical care at the earliest possible moment.

Adequate standards for cardiac clinics have been established. A cardiac clinic should meet standards similar to those established by the New York Heart Association and modified for national use by the American Heart Association.⁹ An inspection of such standards reveals that the facilities of a cardiac clinic are much more than an examining physician and an electrocardiograph. The standards of the American Heart Association provide among others that the clinic have adequate space, be affiliated with the ward service of a hospital and be directed by a physician who has qualifications equivalent to those required by the American Board of Internal Medicine for certification as a spe-

cialist in internal medicine and the subspecialty of cardiovascular disease, or by those required by the American Board of Pediatrics. In children's clinics it is probably desirable to have the general pediatric care of the child supervised by the pediatrician and the cardiac aspects supervised by a qualified cardiologist. The standards also require that provision should be made for consultation service in required specialties, that adequate records be kept and that adjunct services be available, which for the rheumatic patient would provide for fluoroscopy, electrocardiography and laboratory procedures such as leukocyte counts and sedimentation rates. Adequate nursing service should be available. A medical social worker should be attached to the clinic to work out individual problems concerned with utilization of community resources for the benefit of the patient. Indeed, the effectiveness with which the medical social workers perform their jobs will in the final analysis determine the operating efficiency of the clinic.

In summary, then, a community rheumatic fever program is essential if complete care is to be given to patients suffering from rheumatic disease, and the cardiac clinic with an affiliated registry should serve as the focus around which the community rheumatic fever program should be built.

THE GEOGRAPHIC DISTRIBUTION OF HEMOLYTIC STREPTOCOCCI

RELATIONSHIP TO THE INCIDENCE OF RHEUMATIC FEVER

MAJOR ARIE C. VAN RAVENSWAAY

Medical Services Division, Office of the Air Surgeon, Washington, D. C.
MEDICAL CORPS, ARMY OF THE UNITED STATES

Geographic variations in the distribution of hemolytic streptococci and in the incidence of acute rheumatic fever have been generally recognized.¹ Much use has been made of these observations, both as an approach for studying the etiology of rheumatic fever and as a therapeutic answer for those individuals found to be susceptible to this disease. Coburn² has described the results of sending a group of rheumatic children to Florida. This study is well known, but its application has been limited in civilian life by the lack of a nationwide organization to promote its utilization on a large scale.

The concept of a probable relationship between streptococcal infections and rheumatic fever is now widely accepted. The intimate study of this relationship from a bacteriologic standpoint has been made possible by the classification of the hemolytic streptococcus by Lancefield³ and Griffith⁴ into a system of

From the Army Air Forces Rheumatic Fever Control Program. Read in a symposium on "Rheumatic Fever" before the Section on Pediatrics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

The data used in preparing this report were gathered at a number of Army Air Forces installations under the direction of the following personnel: Lieut. Wendell Edmund Felix, Sn. C., Captain Edward D. Toth, Sn. C., Captain Joseph S. Guts, Sn. C., Major Leslie R. Grams, Freis, M. C., Captain Joseph S. Guts, Sn. C., Major Leslie R. Grams, M. C., Captain Charles G. Jennings, M. C., Captain Arthur C. Jordan, Sn. C., Major Samuel Malamed, M. C., and Captain Roland B. Mitchell, Sn. C.

1. Paul, J. R.: *The Epidemiology of Rheumatic Fever and Some of Its Public Health Aspects*, ed. 2, New York, Metropolitan Life Insurance Company, 1943.

2. Coburn, A. F.: *Factor of Infection in the Rheumatic State*, ed. 1, Baltimore, Williams & Wilkins Company, 1931.

3. Lancefield, R. C.: *Antigenic Complex of Streptococcus Hemolyticus: Demonstration of Type Specific Substances in Extracts of Streptococcus Hemolyticus*, J. Exper. Med. 47: 91-103 (Jan.) 1928.

4. Griffith, F.: *Serological Classification of Streptococcus Pyogenes*, J. Hyg. 34: 542-584 (Dec.) 1934.

7a. Hamilton, B. E., and Thomson, K. J.: *The Heart in Pregnancy and the Childbearing Age*, Boston, Little Brown & Co., 1941, pp. 228-229.

8. Wilson, M. G.; Schweitzer, M. D., and Lubchenco, R.: *The Familial Epidemiology of Rheumatic Fever: Genetic and Epidemiologic Studies*, J. Pediatr. 22: 468-581, 1943.

9. Standard Requirements for a Cardiac Clinic, modified from those of the New York Heart Association by the American Heart Association, New York, 1941.

groups and types and the development of practical methods for their differentiation. The contribution which the Rockefeller Institute for Medical Research is making in serving as a source for the specific grouping and typing serums used in these methods cannot be overemphasized.

My purpose in this paper is to describe geographic variations in the distribution of the component types of group A hemolytic streptococci as observed in Army Air Forces installations and the relationship between these variations and the incidence of rheumatic fever. Reference is made to the use of this information in the management of acute rheumatic fever.

At eight Army Air Forces installations, laboratories for the grouping and typing of hemolytic streptococci are in operation. Credit for the accumulation of material reported in this paper belongs to the personnel responsible for the organization of these laboratories and the development of methods for handling the large amount of bacteriologic material involved in this study. These laboratories have been located so as to represent both areas of low incidence and areas of high incidence of rheumatic fever.

In general, an effort has been made to obtain information in four categories:

1. Hemolytic streptococcus post survey (carrier) rates
2. Incidence of hemolytic streptococci in hospital admissions for upper respiratory disease.
3. The grouping and typing of hemolytic streptococci isolated from patients with scarlet fever.
4. The grouping and typing of hemolytic streptococci isolated from patients with rheumatic fever and from respiratory infections antecedent to rheumatic fever.

The results of these studies have been summarized in the accompanying tables.

GEOGRAPHIC DISTRIBUTION OF HEMOLYTIC STREPTOCOCCI AS DETERMINED BY POST SURVEY

Table 1 indicates the variations in incidence of hemolytic streptococci observed in samples of troops from posts at which the eight laboratories are located. These represent the averages of a series of surveys done at intervals during the period from Jan. 1 to April 21, 1944. The number of cultures involved varies from 245 to 3,222 for the individual posts and total 8,992 for the group. This study indicates for the winter season involved and on a basis of the posts studied that the distribution of hemolytic streptococci throughout troop population is much greater in the Rocky Mountain area and adjacent parts of the country than at posts located in the southern parts of the country.

An analysis of table 1, while indicating great variations in percentage incidence of the hemolytic streptococcus and its component groups and types, shows in general a rather widespread distribution of those different components and no tendency for certain of the types to supplant completely all the others in certain areas. The latter state of affairs would of course be surprising in view of the constant to and fro movement of troops during the process of their training and is in contrast to the epidemic situations which at times arise in relatively isolated groups in civilian life due to a single type of hemolytic streptococcus. This situation is occasionally approached in small posts with relatively stable personnel but has not been observed in this experience in any of the large Air Forces installations engaged in the training of troops.

GEOGRAPHIC DISTRIBUTION OF HEMOLYTIC STREPTOCOCCI IN HOSPITAL ADMISSIONS FOR UPPER RESPIRATORY DISEASE

In table 2 are summarized the results of bacteriologic studies done on patients hospitalized for upper respiratory disease. While it appears that types 19, 17, 30, 3, 1, 36 and 6 are associated with the majority of these infections, at all posts with significant incidence rates a multiplicity of other types are involved.

TABLE 1.—*Geographic Distribution of Hemolytic Streptococci in Army Air Forces Installations as Determined by Post Survey*

Posts	Recorded as Percentage							Days Mon- than	Total
	Buck- ley	Kearns	Amn- rillo	Lin- coln	SAACC	Drew	Davis		
No. men surveyed	1,303	425	8,003	341	3,322	651	136		16,493
No. of surveys	9	13	8	3	7	2	2		
Hemolytic strepto- cocci	304	134	194	176	64	160	29		190
Group									
B			31		02	18			19
C			08			22	07		05
D			001			06			003
E		33	066				15		01
F			02			17			02
G			001			06			06
H			11			18			07
L			02						009
Group									
A	303	92	131	97	03	14	07		146
Type									
1	48	26	00	15		02	07		14
2			006						003
3	52	09	31	12					24
4			007						004
5		02	007						007
6	11	02	10	06					07
8	02	01	001						005
9			002						02
11									
12	02	07	03			02			02
13		02							001
14	47		001						08
15									
17	02	12	15		01				10
18	05		001	03		02			007
19	53	19	22	24	01				27
22			002						001
23	01		001			02			002
24	02	05	04						03
26	01		02						01
28		02	005	03					004
29	01		05	03					07
30	19	02	19	09	01				14
31	01								001
32									
33	01			03		02			002
36	27	02	009						048
37									
38			001	00					003
39		02	001						001
40			001						001
41			001			02			001
43	01		001						001
44			001	12		02			002
46	02		003						007

GEOGRAPHIC DISTRIBUTION OF HEMOLYTIC STREPTOCOCCI IN HOSPITAL ADMISSIONS FOR SCARLET FEVER

Table 3 summarizes the results in 286 cases of scarlet fever. In 229 cases group A hemolytic streptococci were isolated, representing some twelve types. Here again types 1, 3, 17, 19 and 30 are the common types.

THE GEOGRAPHIC DISTRIBUTION OF HEMOLYTIC STREPTOCOCCI ISOLATED FROM PATIENTS WITH RHEUMATIC FEVER

Approximately 1,600 throat cultures have been done on some 400 patients with rheumatic fever at various stages of their disease. The types obtained at individual posts paralleled closely the types observed with respiratory disease and scarlet fever. For the following

reasons these studies are felt to have little etiologic importance and are not presented in tabulated form. In 36 patients pharyngeal cultures were obtained during an upper respiratory infection which preceded by two to four weeks the onset of acute rheumatic fever. An

TABLE 2.—*Geographic Distribution of Hemolytic Streptococci in Patients Hospitalized for Upper Respiratory Infections in Army Air Forces Installations*

(Recorded in Percentage of Total Group Surveyed)									
Posts	Buck- ley	Lowry	Kearns	Ama- rillo	Lin- coln	SAACC	Drew	Davis Mon- than	Total
No. men surveyed	2,215	737	1,050	2,889	397	401	181	374	8,404
No. of surveys	6	9	12	...	11	2	2	17	...
Hemolytic strepto- cocci....	59.0	15.0	35.9	70.7	18.6	6.7	7.2	56.6	54.6
Group									
B.....	...	...	...	0.6	...	...	...	0.3	0.2
C.....	...	...	...	3.1	...	...	0.6	2.4	1.2
D.....	...	...	...	4.3	...	...	...	0.6	1.6
E.....	...	1.9	0.6	5.7	...	...	...	2.1	2.3
F.....	...	0.4	...	0.9	...	...	1.1	0.3	0.4
G.....	...	...	...	0.5	...	...	...	0.3	0.2
H.....	...	...	...	4.5	...	...	0.6	...	1.5
I.....	...	...	...	0.7	...	...	...	...	0.2
Group									
A.....	58.2	42.9	21.6	49.8	37.0	6.3	2.8	49.4	43.9
Type									
1.....	7.0	3.3	2.4	4.9	1.2	...	...	3.9	4.4
2.....	0.1	...	...	0.2	...	...	...	0.6	0.1
3.....	7.2	2.6	2.9	11.5	1.5	...	...	1.5	6.5
4.....	0.1	...	...	0.07	...	...	...	...	0.6
5.....	0.2	0.3	...	0.1	...	...	...	0.3	0.1
6.....	2.5	0.9	0.6	4.7	0.8	...	...	0.9	2.5
8.....	0.2	...	...	...	...	...	...	0.6	0.07
9.....	0.1	...	...	...	...	...	...	...	0.02
11.....	0.1	...	...	...	...	...	...	0.3	0.05
12.....	0.4	...	0.4	0.5	...	...	...	1.5	0.3
13.....	0.1	...	...	0.2	...	...	...	...	0.06
14.....	5.9	2.6	0.7	0.1	...	...	...	0.3	1.9
15.....	...	...	0.1	...	...	...	...	...	0.01
17.....	0.4	0.8	4.8	0.5	...	3.9	...	6.9	3.5
18.....	0.2	0.1	...	0.03	...	...	...	0.3	0.08
19.....	16.9	9.9	3.3	8.8	3.4	...	0.6	18.3	9.2
22.....	...	...	0.1	...	0.2	...	...	...	0.02
23.....	0.1	...	...	...	...	...	...	...	0.01
24.....	0.5	...	...	0.1	0.2	...	...	0.6	0.3
26.....	0.3	0.5	...	0.9	0.5	0.1	...	7.8	0.9
28.....	0.2	...	0.1	0.1	...	...	0.6	1.2	0.1
29.....	0.1	...	0.1	0.5	...	...	...	...	0.2
30.....	3.9	2.2	6.2	6.6	1.2	2.0	0.6	9.6	4.8
31.....	...	...	...	...	0.2	...	...	...	0.01
32.....	0.1	0.1	0.1	...	...	...	0.6	...	0.05
33.....	0.2	...	...	0.07	...	...	...	...	0.07
36.....	4.2	1.9	1.8	0.04	0.7	...	1.2	1.6	...
37.....	0.1	0.1	...	...	0.2	...	...	...	0.04
38.....	0.1	0.3	...	...	...	...	...	...	0.04
39.....	0.1	...	...	...	0.2	...	...	...	0.04
40.....	...	...	...	...	...	...	...	...	...
41.....	0.1	...	0.1	0.2	...	...	...	0.1	...
43.....	0.2	...	...	0.2	...	...	0.6	0.3	0.1
44.....	0.1	0.1	...	0.07	...	...	...	...	0.1
46.....	0.4	...	...	1.2	...	...	...	...	0.5

analysis of the cultures taken after the onset of the latter disease shows that in 28 instances cultures at that time revealed a different type of hemolytic streptococcus. In 4 instances no organisms were recovered (when hemolytic streptococci had been found at the initial examination). In only 6 instances was the same Lancefield type of hemolytic streptococcus isolated at both examinations. Thirty-one strains representing nine Lancefield types were found at the initial culture. If it is assumed that the strains found at the original culture were in large part the organisms responsible for the infection which precipitated the episode of acute rheumatic fever, subsequent cultures must therefore in the majority of instances represent asymptomatic and unrelated cross infections. This thesis is elaborated in table 4. Serial throat cultures taken at intervals approximating seven days in 74 rheumatic fever patients at Buckley Field, Colorado (a post with a high incidence of rheumatic fever), are arranged in columns to

indicate whether the strains listed were isolated from the same individual at the preceding examination or whether they represent a change from this examination.

It happened that in only 1 instance was the same Lancefield type found at the second examination as was isolated at the first, while 37 new strains appeared. This ratio fell with succeeding cultures but further demonstrates the impossibility of obtaining information regarding the bacteriology of the precipitating infection from pharyngeal cultures done following the development of acute rheumatic fever under the conditions which exist at Army posts which have high incidence rates for streptococcal disease and rheumatic fever. A different situation may exist in small static and comparatively isolated groups in which a single type of hemolytic streptococcus may become epidemic.

A study from the Army Air Forces Regional Station Hospital at Davis Monthan Field at Tucson, Ariz., which is located in an area of low incidence of rheumatic fever and streptococcal disease and to which rheumatic

TABLE 3.—*Geographic Distribution of Hemolytic Streptococci Isolated from Patients Hospitalized for Scarlet Fever*

(Recorded in Percentage of Total Group Surveyed)									
Posts	Buck- ley	Lowry	Kearns	Ama- rillo	Lin- coln	SAACC	Drew	Davis Mon- than	Total
No. men surveyed	82	15	30	272	17	21	11	18	465
No. of surveys	...	9	12	...	11	7	2	17	...
Hemolytic strepto- cocci....	81.7	60.0	100.0	87.9	88.2	100.0	100.0	94.4	88.0
Group									
B.....	...	...	...	0.4	...	...	...	...	0.2
C.....	...	...	...	0.4	...	...	...	...	0.2
D.....	...	...	...	0.4	...	...	...	...	0.2
E.....	...	...	...	1.5	...	...	...	...	0.9
F.....	...	...	...	0.4	...	...	...	...	0.2
G.....	...	...	...	...	...	...	...	...	...
H.....	...	...	...	2.2	...	...	...	...	1.3
I.....	...	...	...	0.7	...	...	...	...	0.4
Group									
A.....	79.3	69.0	96.7	80.2	52.9	100.0	100.0	94.4	81.5
Type									
1.....	7.3	...	...	4.0	11.8	...	...	...	4.1
2.....	...	...	...	0.4	...	...	...	...	0.2
3.....	29.3	20.0	3.3	20.6	...	...	...	...	18.1
4.....	...	...	...	...	...	...	...	...	...
5.....	...	...	...	...	...	...	...	...	...
6.....	...	6.7	3.3	0.7	...	...	...	...	0.9
8.....	...	...	...	...	...	...	...	...	...
9.....	...	...	...	...	...	...	...	...	...
11.....	...	...	...	...	...	...	...	...	...
12.....	...	...	...	...	...	...	9.1	...	0.5
13.....	1.2	...	...	0.7	...	...	...	...	0.7
14.....	3.7	...	...	...	...	...	...	...	0.7
15.....	...	...	...	...	...	...	...	...	...
17.....	...	...	33.3	21.3	11.8	42.9	27.3	33.3	18.9
18.....	...	...	...	...	...	...	...	...	...
19.....	26.8	6.7	16.7	5.5	5.9	...	...	3.6	9.7
22.....	...	...	...	...	...	...	...	...	...
23.....	...	...	...	...	...	...	...	...	...
24.....	...	...	...	...	...	...	...	...	...
26.....	...	...	...	0.7	...	...	...	...	0.4
28.....	...	...	...	...	...	...	...	...	...
29.....	...	...	...	0.7	...	...	...	...	0.4
30.....	19.5	13.3	36.7	21.7	...	57.1	34.6	55.6	25.0
31.....	...	...	...	...	...	...	...	...	...
32.....	...	...	...	...	...	...	...	...	...
33.....	...	...	...	...	...	...	...	...	...
36.....	2.4	...	3.3	...	...	...	...	...	0.4
37.....	2.4	...	...	...	...	...	...	...	...
38.....	...	...	...	...	...	...	...	...	...
39.....	...	...	...	...	...	...	...	...	...
40.....	...	...	...	...	...	...	...	...	...
41.....	...	...	...	...	...	...	...	...	0.2
43.....	...	...	...	0.4	...	...	...	...	...
44.....	...	...	...	...	...	...	...	...	0.2
46.....	...	...	...	0.4	...	...	...	...	...

fever patients are sent for convalescent care, is illustrated also in table 4 for comparison with that at Buckley Field. At this post the relative infrequency with which new strains of hemolytic streptococci were acquired is as impressive as is the tendency of the indi-

vidual strain to persist. Superficially it would appear that newly acquired strains have the ability to supplant those previously present and repetitive infestation to hasten the development of local tissue immunity.

SIGNIFICANCE OF SPECIFIC TYPES OF GROUP A HEMOLYTIC STREPTOCOCCI

It appears, therefore, that while the typing of group A hemolytic streptococci provides a valuable laboratory method for epidemiologic studies, the ability to produce clinical disease is not a quality inherent or possibly restricted to certain types. Rather, it seems to be a function of the invasiveness and virulence of the specific strain involved and subject to the usual variations encountered in these characteristics of bacteria. It is admitted that in this experience certain types were responsible for the majority of the clinical disease studied, but the fluctuation in incidence of the individual

TABLE 4.—Types of Hemolytic Streptococci Isolated from Patients Developing Acute Rheumatic Fever Compared with Those Isolated from the Same Individuals at the Time of the Antecedent Streptococcal Infection

	Antecedent Infection	After Onset of Rheumatic Fever	
		Unchanged*	Changed†
Negative cultures.....	4	2	4
Group.....			
D.....	1	..	..
H.....	..	..	..
Group.....			
A.....	..	..	1
Type.....			
1.....	..	..	2
3.....	4	1	4
4.....	..	..	1
6.....	1	..	1
12.....	2	..	..
14.....	5	2	2
17.....	2	..	..
19.....	10	1	4
24.....	1	..	1
26.....	..	..	1
30.....	2	1	1
36.....	4	1	4
Total.....	36	8	28

* Unchanged = number of strains unchanged since preceding examination; same individual. Changed = number of strains differing from preceding examination; same individual.

† Note.—In 6 of 36 individuals the same Lancefield type was isolated at the two examinations.

types at different posts and at the same post at different portions of the winter season indicates the probability that, in other seasons or other geographic areas, types which were of minimal importance in this survey may play predominant roles.

A summary of this bacteriologic experience is presented in table 6. Recognizing the inaccuracies that are inherent in studies of this type which negate the importance of minor differences in numerical values, there is nevertheless a well defined tendency for streptococcal disease to occur with greater frequency at posts with high post survey rates than in those with low rates of this type. However, even at posts with low post survey rates for hemolytic streptococci this organism may be found with frequency in the upper respiratory infection which does occur. A correlation also exists between post survey rates, scarlet fever and rheumatic fever. A comparison of scarlet fever rates and rheumatic fever rates in over two hundred other Air Forces installations confirms the point that rheumatic fever rarely occurs in areas of low frequency of scarlet fever. The thesis may be advanced that, if the streptococcus etiology of rheumatic fever is correct, even in areas of low incidence of streptococcal disease, rheumatic fever

should occur with approximately the same order of relative frequency with which it is found in epidemic areas. This does not occur, however, and such mathe-

TABLE 5.—Types of Lancefield Group A Hemolytic Streptococci Isolated from Patients with Rheumatic Fever: A Comparison of Observations at Posts of Low and of High Incidence of This Disease

Cultures *	Buckley Field (Denver)				5th		6th		7th	
	1st	2d	3d	4th	Un	Ch	Un	Ch	Un	Ch
No hemolytic strepto- cocci.....	19	7	17	12	5	6	2	5	1	3
Group A—Untyped.....	1	..	1	2	..	1	..	..	..	..
1.....	5	..	3	2	2	1	..	..	..	..
2.....	8	1	7	1	1	..	..	..	..	..
4.....	..	..	1	..	..	..	..	..	..	..
5.....	1	..	..	..	..	..	..	..	..	..
6.....	5	..	..	1	..	..	..	..	..	..
14.....	5	..	14	3	3	1	1	1	..	..
17.....	1	..	1	2	..	..	..	..	..	..
18.....	..	..	..	1	..	..	..	..	..	..
19.....	14	..	5	1	5	2	3	2	1	..
24.....	1	..	1	..	..	..	..	..	..	..
26.....	..	..	..	1	..	..	..	..	..	..
30.....	3	..	3	1	3	1	2	3	1	..
35.....	1	..	..	..	..	..	..	..	..	..
36.....	6	..	1	1	1	2	..	..	..	..
Total.....	74	9	54	19	31	18	8	6	2	3

Davis-Monthan Field (Tucson)										
No hemolytic strepto- cocci.....	74	48	24	16	6	18	2	15	4	15
Type 1.....	14	10	..	2	3	4	..	4	..	2
3.....	3	4	..	2	1	3	..	3	..	..
6.....	3	..	..	3	..	3	..	..	..	..
12.....	1	..	..	..	..	..	..	..	..	..
17.....	9	..	5	4	6	1	7	5	..	4
19.....	25	10	4	7	2	8	..	8	1	7
24.....	1	..	..	..	..	..	..	..	..	..
26.....	1	..	1	1	..	1	..	1	..	..
28.....	2	..	1	..	..	1	1	1	1	..
30.....	17	14	3	6	1	6	2	7	..	7
36.....	5	4	4	2	..	2	1	2	..	..
Total.....	137	107	41	45	14	73	6	46	6	35

* "Un" = Number of strains unchanged since preceding examination; same individual. "Ch." = Number of strains differing from preceding examination; same individual.

† Two cultures contained two types of hemolytic streptococci.

TABLE 6.—A Comparison of Streptococcus Carrier Rates, Streptococcal Disease and Rheumatic Fever at Geographically Separated Army Air Forces Installations

Posts	Buckley Field, Colo.	Kearns Field, Utah	Anna-Millo Field, Texas	Lindcoln AAF, Neb.	San Antonio ACC, Texas	Drew Field, Fla.	Davis-Monthan Field, Ariz.
1. Post survey Rates * (carrier rates) group A, hemolytic streptococci.....	39	9.2	1.3	9.7	0.5	1.4	0.7
2. Per cent group A * hemolytic streptococci in admissions for upper respiratory infections.....	52	24	59	37	6.3	2.8	49
3. Rates, upper respiratory infections.....	1,104	755	500	517	195	140	257
4. Rates, group A hemolytic streptococci upper respiratory infections.....	640	181	295	192	12.2	4.2	128
5. Rates, scarlet fever.....	23	59	24	15	5	1	5
Rates, rheumatic fever.....	49	21	11	10	Below 2	Below 2	Below 2

* These rates represent averages on available studies. Since surveys were not done each week at all posts, they must be taken as indicating general trends rather than actual rates for the entire period.

Note: Line 2 × line 3

mathematical expectations could be filled only if these organisms possessed fixed qualities of virulence and their potential hosts had fixed degrees of resistance.

THE SIGNIFICANCE OF THIS INFORMATION FROM THE STANDPOINT OF MILITARY MEDICINE

Ample evidence is at hand to indicate that a persistence or recurrence of rheumatic activity is related to a persistence or recurrence of the precipitating bacterial infection.⁵ Jones⁶ has clearly shown that an initial episode of rheumatic fever predisposes to further attacks of the disease.

For these reasons the Army Air Forces has adopted the plan of evacuating patients with rheumatic fever to suitable Army Air Forces Regional Station Hospitals, which are picked on the basis of low incidence of streptococcal disease, low incidence of rheumatic fever and suitability for the convalescent care of this disease. At the present time all Air Forces personnel developing rheumatic fever are being moved to such installations when conditions permit.

Whenever practicable this is done by air, which permits transfer by litter at a very early stage of the disease. Approximately 200 cases per month are being moved by air at the present time. In those situations in which air evacuation is not feasible, the movement is made by train at a suitable time in the course of the disease.

It may be appropriate to comment on the overall program for the care of rheumatic fever patients in the Army Air Forces. This disease produces permanent noneffectiveness in several ways. Approximately one third develop permanent cardiac lesions. A second group of significant size develop neuroses usually of a cardiac or neurocirculatory type. A third group are recurrently disabled because of further attacks of the disease.

It is hoped that early diagnosis and proper treatment with early transfer to areas of low incidence will limit the incidence of residual valvular disease. Great care is being taken during the period of activity of the disease not to alarm the patient about the cardiac aspects of the problem. He is then kept in the area of low incidence for a minimum period of six months. During the initial part of the period and following the cessation of the active phase of the disease he receives a suitable period of physical rehabilitation. By concentrating these patients in rather large groups it has been found possible to adapt the convalescent training program more effectually to their specific needs. Following rehabilitation they are given useful employment about the post as a phase of the convalescent program and under medical supervision.

At the termination of the six months period or any additional length of time considered desirable for maximum improvement, the patient is evaluated on the basis of his then existing physical condition and suitable disposition or further military assignment made.

CONCLUSIONS

1. Bacteriologic studies at eight Army Air Forces installations during the period Jan. 1 to April 21, 1944 reveal that group A hemolytic streptococci isolated from cases of upper respiratory disease, scarlet fever and acute rheumatic fever belonged to a multiplicity of Lancefield types.

2. At none of the posts studied was a single epidemic strain responsible for the streptococcal disease observed.

3. Swift, H. F.: Rheumatic Fever, in Cecil, R. L.: *A Textbook of Medicine*, ed. 6, Philadelphia, W. B. Saunders Company, 1943, pp. 435-450.

6. Jones, T. D., and Mote, J. R.: The Clinical Importance of Infection of the Respiratory Tract in Rheumatic Fever, *J. A. M. A.* 113: 598-602 (Sept. 2) 1939.

3. At the posts studied bacteriologic data obtained after the development of acute rheumatic fever were not applicable to the preceding upper respiratory infections.

4. An apparent correlation was observed between post survey (carrier) rates from group A hemolytic streptococci, incidence rates for scarlet fever and the incidence of acute rheumatic fever.

THE PREVENTION OF RECURRENCES IN RHEUMATIC SUBJECTS

CAROLINE BEDELL THOMAS, M.D.

Associate in Medicine, Johns Hopkins University School of Medicine
BALTIMORE

Rheumatic fever is a recurrent disease, and the danger of developing permanent organic heart disease increases with every recurrence. These considerations have stimulated a wide search for measures to prevent the recurrent attacks. For years it has been recognized that infections of the nasopharynx, especially sore throat and tonsillitis, frequently precede exacerbations of rheumatic fever. On this account it has been almost universal practice to perform tonsillectomy and adenoidectomy on rheumatic patients in the quiescent stage in the hope of decreasing the frequency and intensity of such infections of the upper respiratory tract and avoiding rheumatic flare ups. However, this hope has not been fulfilled; tonsillectomized patients continue to have rheumatic recrudescences nearly as often as before, although Allan and Baylor¹ have shown that there seems to be less likelihood of rheumatic heart disease developing after tonsillectomy in those who had escaped it up to the time of the operation.

Since the publication of Coburn's² monograph "The Factor of Infection in the Rheumatic State" in 1931 the close etiologic relationship between the beta hemolytic streptococcus and rheumatic fever has become increasingly clear. It is not surprising, therefore, that tonsillectomy is relatively ineffective in forestalling rheumatic recurrences, since beta hemolytic streptococcus infections of the throat continue whether the tonsils and adenoids are present or not. In this regard Coburn³ has emphasized the fact that rheumatic fever is most frequently preceded by rather superficial infections such as mild pharyngitis, in contrast to glomerulonephritis, in which "deeper" antecedent infections such as otitis media and sinusitis are more common.

Because the tropical and subtropical zones are relatively free from the hemolytic streptococcus and from rheumatic fever, Coburn sent a group of 10 rheumatic fever patients to Puerto Rico for six months and noted that no detectable evidence of fresh rheumatic activity occurred in the patients while in Puerto Rico but that definite recrudescences followed shortly after their arrival in New York in the hot summer months. Since that time many physicians have sent their private patients to Florida or Arizona for the winter and spring months, when rheumatic fever is most prevalent in the

Read in a symposium on "Rheumatic Fever" before the Section on Pediatrics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Allan, W. B., and Baylor, J. W.: *The Influence of Tonsillectomy upon the Course of Rheumatic Fever and Rheumatic Heart Disease*, Bull. Johns Hopkins Hosp. 62: 111, 1938.

2. Coburn, A. F.: *The Factor of Infection in the Rheumatic State*, Baltimore, Williams & Wilkins Company, 1931.

3. Coburn, A. F.: Faulty Disposal of Streptococcus Hemolyticus in Relation to the Development of the Rheumatic Lesion, *Tr. & Stud. Coll. Physicians*, Philadelphia 8: 91, 1940.

North. This method of prevention of rheumatic recurrences has been fairly effective, but its usefulness is greatly limited by the expense and inconvenience of the undertaking, which must be repeated yearly for five or more seasons if it is to accomplish its object.

In 1936 among the early reports published abroad on the therapeutic value of sulfanilamide was one⁴ which showed that smaller than therapeutic doses of sulfanilamide, administered before the streptococcus had had an opportunity to invade and multiply in the tissues, were effective in preventing beta hemolytic streptococcus infections in mice. This discovery offered the opportunity my associates and I had been searching for, and we immediately embarked on the endeavor to prevent acute hemolytic streptococcus infections and subsequent rheumatic recurrences by giving small daily doses of sulfanilamide to a group of rheumatic subjects over a long period of time.

For four years, from October or November to June, we administered prophylactic sulfanilamide in doses of 1 to 1.2 Gm. a day to a group of adolescents and young adults and compared the results with those observed in an untreated control group of similar rheumatic subjects.⁵ The results, both as regards inhibiting beta hemolytic streptococcus infections and preventing rheumatic recurrences, were strikingly favorable. During the four year study, not a single major attack of rheumatic fever occurred in any patient while taking sulfanilamide prophylactically. In contrast, 15 major rheumatic episodes were observed among the control patients during the same period (an incidence of 10 per cent), and 5 more control patients suffered from acute illnesses which might have been rheumatic in character. None of the patients receiving sulfanilamide prophylactically suffered from any acute beta hemolytic streptococcus infection during the period of treatment in contrast to the control group, and throat cultures positive for the beta hemolytic streptococcus were three times less common among the treated subjects than among the controls.

Coburn and Moore⁶ gave prophylactic sulfanilamide to a group of rheumatic children and observed only 1 rheumatic recurrence among 184 subjects. Other investigators,⁷ working chiefly with children, undertook the same problem, and all have reported excellent results in that rheumatic recurrences have been rare or absent during the period of prophylactic treatment. These reports have now been published in detail, so that I will only summarize them briefly by saying that up to the present in civilian life prophylactic sulfanilamide has been administered to rheumatic subjects for a total of 815 patient seasons over a period of seven years.

4. Buttle, G. A. H.; Gray, W. H., and Stephenson, D.: Protection of Mice Against Streptococcal and Other Infections by *p*-Aminoazobenzene-sulfonamide and Related Substances, *Lancet* 1: 1286, 1936.

5. Thomas, C. B., and France, R.: A Preliminary Report of the Prophylactic Use of Sulfanilamide in Patients Susceptible to Rheumatic Fever, *Bull. Johns Hopkins Hosp.* 64: 67, 1939. Thomas, C. B.; France, R., and Reichsman, F.: The Prophylactic Use of Sulfanilamide in Patients Susceptible to Rheumatic Fever, *J. A. M. A.* 116: 551 (Feb. 15) 1941.

6. Coburn, A. F., and Moore, L. V.: Prophylactic Use of Sulfanilamide in Streptococcal Respiratory Infections, with Especial Reference to Rheumatic Fever, *J. Clin. Investigation* 18: 147, 1939.

7. Stowell, D. D., and Button, W. H., Jr.: Observations on the Prophylactic Use of Sulfanilamide on Rheumatic Patients, *J. A. M. A.* 117: 2164 (Dec. 20) 1941. Thomas, C. B.: The Prophylactic Treatment of Rheumatic Fever by Sulfanilamide, *Bull. New York Acad. Med.* 18: 508, 1942. Chandler, C. A., and Taussig, H. B.: Sulfanilamide as a Prophylactic Agent in Rheumatic Fever, *Bull. Johns Hopkins Hosp.* 72: 42, 1943. Kuttner, A. G., and Meyersbach, G.: Prevention of Streptococcal Upper Respiratory Infections and Rheumatic Recurrences in Rheumatic Children by Prophylactic Use of Sulfanilamide, *J. Clin. Investigation* 22: 77, 1943. Hansen, A. E.; Platon, R. V., and Dwan, P. F.: Prolonged Use of a Sulfonamide Compound in Prevention of Rheumatic Recurrences in Children, *Am. J. Dis. Child.* 64: 963 (Dec.) 1942. Feldt, R. H.: Sulfanilamide as a Prophylactic Measure in Recurrent Rheumatic Infection: A Controlled Study Involving One Hundred and Thirty-One "Patient-Seasons," *Am. J. M. Sc.* 207: 483, 1944.

Only 8 have had recrudescences, an incidence of less than 1 per cent, while the incidence among control groups ranged from 10 to 35 per cent.

During the past winter the United States Navy conducted the most extensive program of mass prophylaxis of respiratory disease and rheumatic fever which has even been undertaken. Capt. T. J. Carter and Comdr. Alvin F. Coburn, who have directed the program, have kindly given me permission to read the detailed reports and to summarize their results. The program was inaugurated in the attempt to reduce the incidence of streptococcal infections, which always account for much loss of time through illness during the late winter and early spring in any center where large groups of young men are living in close quarters, and, especially, to prevent acute rheumatic fever, which had become quite prevalent in some of the training centers. Prophylactic sulfadiazine, usually 1 Gm. a day, was administered to part of the personnel of several training centers from Dec. 1, 1943 to March 1, 1944, with other groups at the same centers serving as controls; about 250,000 men were taking the prophylactic medication, and an equal number were observed as controls.

During this period hospitalization for severe respiratory disease was reduced 80 to 90 per cent. Streptococcal infections were reduced 85 per cent and the

The Effect of Prophylactic Sulfadiazine on the Attack Rate of Rheumatic Fever and Scarlet Fever

Attack Rate	Week of Prophylactic Sulfadiazine Administration				
	1	2	3	4	5
Rheumatic fever.....	87	45	45	19	6
Scarlet fever.....	70	45	0	0	0

incidence of rheumatic fever dropped equally sharply, so that in one center there was only 1 case among the treated group to every 14 cases among the controls. The attack rate of rheumatic fever decreased gradually over the course of several weeks, indicating that prophylactic sulfadiazine interferes with the development of acute rheumatic fever by preventing the antecedent streptococcal infection. If the drug is started during the latent period, after the streptococcal infection has occurred but before the appearance of acute rheumatic fever, the acute rheumatic attack develops regardless of the medication.

The difference between the cause of acute rheumatic fever, which we now conceive of as an allergic state analogous to serum sickness, usually produced by sensitization to the beta hemolytic streptococcus, and the cause of scarlet fever, which is directly produced by infection with the beta hemolytic streptococcus, is shown in the accompanying table.

Here is the incidence of rheumatic fever and scarlet fever week by week after sulfadiazine prophylaxis was started at one of the naval training centers. The lag shown in the tapering off of rheumatic fever as compared with scarlet fever corresponds very well to the conception of a latent period of one to four weeks following the original streptococcal infection before rheumatic fever appears.

During the mass prophylactic sulfadiazine program, meningococcal meningitis practically disappeared, and pneumococcal infections were reduced about 50 per cent. Virus infections were not definitely affected, although there was some drop in the incidence of "catarrhal fever," probably indicating that some grippal

infections are actually caused by streptococci. The program was so efficacious that in March the entire personnel at eight naval training centers were placed on daily doses of sulfadiazine, with reversal of the rising incidence of respiratory diseases among the previously untreated personnel.

Evidence is being accumulated during this program as to the minimal effective prophylactic dose; at present it appears that 0.5 Gm. a day is slightly less effective than 1.0 Gm. a day in adults. Mild drug reactions occurred in 0.3 to 0.6 per cent, but severe reactions were exceedingly rare.

Two other preventive measures which I can only mention briefly are, first, the attempt to immunize rheumatic children by repeated injections of a filtrate of *Streptococcus hemolyticus*. Earlier investigators⁸ were unable to find any evidence that this form of immunization increased resistance to streptococcal infections or rheumatic recrudescences. Wasson⁹ and Wasson and Brown,¹⁰ however, reported more than four times as many attacks among the control patients as in immunized subjects, although 10 per cent of those treated still developed rheumatic recrudescences. The second method is that of giving salicylates prophylactically, since it had been shown¹¹ that acetylsalicylic acid usually prevents the arthritis of serum sickness and that in patients so treated the production of precipitins against horse serum was inhibited. When doses of 20 to 30 grains (1.3 to 2 Gm.) were given daily over a period of months, the incidence of recurrences did not seem to differ greatly between the treated and the control groups.¹² However, Schlesinger¹³ and later Coburn and Moore¹⁴ gave salicylates daily for one month after the onset of pharyngitis in rheumatic children and found it quite effective in reducing the incidence of rheumatic recrudescences. At present neither of these two prophylactic methods has been widely enough used to gain a clear statistical evaluation of their merits. Both are still in the experimental stage, but it seems probable that neither immunization to streptococcus filtrates nor prophylactic salicylates offers nearly the degree of protection against rheumatic recurrences that is afforded by sulfonamide prophylaxis.

Small daily doses of sulfonamides, therefore, seem to be the most effective method of preventing rheumatic recrudescences that has yet been found, and I believe that such prophylaxis should be given to all children and young adults who have had one or more unequivocal attacks of acute rheumatic fever. Sulfadiazine is probably the drug of choice, although sulfanilamide affords just as efficient protection and is not significantly toxic when low doses are given. It may be that sulfamerazine will some day replace the other drugs on

account of its slower rate of excretion, but no large scale study of sulfamerazine prophylaxis of rheumatic fever has yet been carried out.

Since the dose of 1 Gm. daily of sulfadiazine used in the Navy program corresponds extremely closely with our dosage of sulfanilamide, in contrast to the 2 or 3 Gm. daily used by some investigators, and since excellent protection is afforded by this dosage, there seems no reason to give more, and unless further evidence to the contrary is obtained it would usually be unwise to give less either to children or to adults. In the Navy, for purposes of convenience, two 0.5 Gm. tablets were given at once every twenty-four hours, but since the drug is largely excreted in a few hours 0.5 Gm. every twelve hours offers greater protection, at least theoretically.

As soon as a patient has reached a satisfactory convalescent stage following acute rheumatic fever, that is, when he is free from arthritis, fever and other symptoms in the absence of salicylates, prophylactic sulfonamide should be started. In my experience it is not necessary to wait until the sedimentation rate is entirely normal. It is important to start prophylaxis before the patient returns to his home environment from hospital or convalescent home, to avoid immediate reinvasion of the nasopharynx by the beta hemolytic streptococcus. In an effort to avoid toxic reactions, I should like to suggest starting most patients on 0.5 Gm. a day for three weeks, during which time the patient should be protected from close contact with crowds, after which the dose should be increased to 1 Gm. a day.

The patient should then continue to take 1 Gm. a day, day in and day out, summer and winter, year in and year out, for at least five years, and probably longer in younger children, if the patient is to be safely steered through the period when recrudescences are most frequent. This seems a long time, but in my experience patients become thoroughly accustomed to taking it, and, rightly or wrongly, ascribe an unusual state of well being to the drug, so that they are loath to stop. They no longer suffer from most of the bacterial infections, although they still may have the common cold in mild form, influenza and the virus diseases of childhood. Several of my patients have noticed the complete abatement of various minor ailments, such as recurrent erysipeloid infections of the face or otitis media, from which they formerly suffered. One of my patients has taken prophylactic sulfanilamide successfully for nearly eight years!

How great is the danger of toxic reactions? Statistically, it is very small, as has been convincingly shown by the United States Navy program. Mild reactions such as transient skin eruptions, which were annoying but not dangerous, developed in from 3 to 6 men out of 1,000, while serious reactions, such as agranulocytosis and exfoliative dermatitis, were exceedingly rare among the 500,000 men who have received prophylactic sulfadiazine at one time or another during the last six months. Since the risk of serious toxicity during treatment is much less than the chance of untreated rheumatic subjects developing recrudescences leading to serious rheumatic heart disease, we should certainly treat the rheumatic patient to the best of our present therapeutic knowledge with prophylactic sulfonamide therapy.

What can the physician do to safeguard a patient to whom sulfonamide prophylaxis is given? First, he should see that the patient is in the best possible physical

8 Wilson, M. G., Joseph, M. G., and Lang, D. M. Intravenous Vaccination with Streptococci. Its Influence on Incidence of Recurrence of Rheumatic Fever in Children, *Am. J. Dis. Child* **46**:1329 (Dec.) 1933.
9 Coburn, A. F., and Paul, R. H. Studies on Immune Response of Rheumatic Subject and Its Relationship to Activity of Rheumatic Process. Active and Passive Immunization to Hemolytic Streptococcus in Relation to Rheumatic Process, *J. Clin. Investigation* **14**:763, 1935.
10 Wasson, V. P. Immunization Against Rheumatic Fever with Hemolytic Streptococcus Filtrate, *Am. Heart J.* **15**:257, 1938.
11 Wasson, V. P., and Brown, E. E. Immunization Against Rheumatic Fever with Hemolytic Streptococcus Filtrate, *Am. Heart J.* **20**:1, 1940. Further Studies in Immunization Against Rheumatic Fever, *ibid* **23**:291, 1942.

12 Derick, C. L., Hitchcock, C. H., and Swift, H. F. Effect of Anti Rheumatic Drugs on the Arthritis and Immune Body Production in Serum Disease, *J. Clin. Investigation* **5**:427, 1928.

13 Leech, C. B. Value of Salicylates in Prevention of Rheumatic Manifestations, *J. A. M. A.* **95**:932 (Sept. 27) 1930. Perry, C. B. Value of Salicylates in Prevention of Rheumatic Relapses, *Lancet* **1**:649, 1938.

14 Schlesinger, B. Public Health Aspect of Heart Disease in Childhood, *Lancet* **1**:649, 1938.

15 Coburn, A. F., and Moore, L. V. Salicylate Prophylaxis in Rheumatic Fever, *J. Pediatr.* **21**:180, 1942.

condition, with adequate diet, and without unusual factors affecting his health or environment during the early weeks of treatment. It was noted in the Navy that the number of mild toxic dermal reactions was nearly four times as great among new recruits who received prophylactic sulfadiazine while they were being immunized to typhoid, tetanus and so on as among seasoned personnel. Second, the dose may be started at 0.5 Gm. a day, increasing to 1.0 Gm. a day after three weeks. Third, parents or patient should be instructed to report any rash or sore throat immediately, without further dosing with sulfonamides by themselves or by any other physician. Fourth, total leukocyte counts should be made frequently during the early weeks of treatment, since agranulocytosis rarely if ever develops after the first six weeks and usually occurs between the end of the second and the fourth week.

It is to be hoped that before the war is over studies conducted among large groups of men in the armed forces may point the way toward reducing toxic reactions to the vanishing point. In conclusion I should like to express the belief that, in spite of the difficulties involved, the increasingly widespread use of prophylactic sulfonamides will bring tremendous advance in the problems of rheumatic fever and rheumatic heart disease.

Johns Hopkins Hospital. _____

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. WILSON AND ROSE LUBSCHETZ,
DR. JONES, DR. RUTSTEIN, MAJOR VAN
RAVENSWAAY AND DR. THOMAS

DR. JOHN R. PAUL, New Haven, Conn.: In trying to determine where the hemolytic streptococcus belongs among the several factors responsible for rheumatic fever, one has the advantage of the experience of the Army during the last three years, in which epidemics of rheumatic fever have been reported in this country for the first time. Such epidemics have put a new light on the subject. Although there have been plenty of isolated cases of rheumatic fever in which it has been difficult to trace any preceding evidence of hemolytic streptococcus infection, I think it is safe to say that there have been no records of epidemics without preceding epidemics of hemolytic streptococcus infection. Dr. Wilson's analyses of recurrence rates are important to those who must try to plan postconvalescent therapy. A program such as Dr. Thomas has outlined may be based, for instance, on the rates at which recurrences may be expected. Dr. Jones has rightfully laid great stress on diagnosis of the acute disease. Is the patient rheumatic or not? This is a big decision if it determines whether or not to embark on four, five or six years of prophylactic sulfonamide therapy. The point that Dr. Rutstein made about the role of the cardiac clinic in establishing the rheumatic register deserves comment. There has been much agitation lately to make rheumatic fever a reportable disease. It has been tried in various parts of the country with varying success. Difficulties are that if rheumatic fever is to be reportable one must first give reasons for making it reportable, one must define diagnostic criteria and one must have facilities for taking care of patients who are reported. If, however, there is a cardiac clinic and it maintains a register, it can function as a local clearing house for cases of rheumatic fever and can be concerned with therapeutic facilities and data on prevalence as well. Major van Ravenswaay has shown what a tremendous opportunity the Army has to outline the geography of this disease. Standard methods can now be employed in attempting to determine how prevalent hemolytic streptococcus types are in various areas and what their correlation with rheumatic fever has been. I should like to ask him whether he has recorded the prevalence of another complication or manifestation of hemolytic streptococcus infection, namely acute nephritis.

COLONEL W. PAUL HOLBROOK, M. C., A. U. S.: The present knowledge regarding the etiology of acute rheumatic fever may be illustrated by describing certain observations made concerning this disease in the Army Air Forces. When a large number of men from all parts of the country are thoroughly mixed and then distributed by posts, some will be located in areas of low incidence and some in areas of high incidence of acute rheumatic fever. Those in areas of low incidence will show a low rate of group A hemolytic streptococcus upper respiratory tract infections as contrasted to a high rate among those in areas of high incidence. Although the total numbers of cases in the two groups contrast sharply, it may be pointed out that upper respiratory disease associated with group A hemolytic streptococci does occur in areas of low incidence of rheumatic fever and proportional incidence rates of the latter disease are not found. As a further result of the shuffling of troops, persons with a family history of rheumatic fever who perhaps are hereditarily susceptible are stationed as frequently in areas of low incidence as in areas with a high incidence of this disease. Since the susceptibles do not develop rheumatic fever in areas of low incidence, it seems that susceptibility cannot be considered the sole explanation. There is evidence to suggest that climate and the invasiveness of the strains of hemolytic streptococci involved may also be important factors. I do not know what all the etiologic factors are, nor do I know how they are interrelated. We can all agree that probably a combination of factors is required to produce acute rheumatic fever in an epidemic form.

DR. STANLEY GIBSON, Chicago: Two years ago Dr. Brown and I at the Children's Memorial Hospital undertook a study of sulfonamide prophylaxis in the recurrence of rheumatic fever. We selected 50 children who had been in the hospital during the previous year with a rheumatic episode. All these children were under the age of 12, so that if I understood Dr. Wilson correctly I believe both as regards age and as regards the time of their previous episode they should be candidates for recurrence of rheumatic fever. About 44 of these children went through the experiment. The other 6 failed to cooperate. None had to be left out because of their inability to take the 1 Gm. of sulfanilamide daily which was given to them. The drug was kept up from about the 1st of October until the 1st of July the following year. During that period we had no single recurrence of a rheumatic episode that we could recognize clinically. We had used up about all of our children who had had an episode during the preceding year, so that we did not attempt a control group. At the end of the first year we checked over these children and found that only 3 out of our 50 children without sulfonamides had had a recurrence of rheumatic fever. However, 1 of these children had a severe recurrence and is much more crippled as a result of that rheumatic recurrence. The second year is almost up and the 1st of July we shall check over our children again. We haven't our figures complete now as to how many recurrences have occurred during the second year. I know this much: One who had had relatively little cardiac involvement previously came back into the hospital about two months ago with a fulminating carditis and promptly died. I do not know whether the statistical method is completely applicable or not in these instances. If the sulfonamides do protect, it was terribly important for that child to have them. I should like to ask Dr. Thomas in her closing discussion to state whether or not any instances of death have occurred from recurrent rheumatic infection in an individual receiving sulfonamides. I am sure I do not know from our small study whether they protect or whether they do not.

DR. JOHN W. SCOTT, Lexington, Ky.: Valuable as the cardiac clinic is, there is, I think, danger of magnifying its function in this connection. Its function should be that of the counselor rather than of the arbiter. That the last word must be said by a specialist in cardiology or by a specialist in anything else is to overstandardize the profession and to contribute to the decay and not the upbuilding of the practice of medicine.

DR. J. D. KEITH, Nova Scotia: I should like to ask Dr. Thomas why she would not use the sulfonamides.

DR. PAUL F. DWAN, Minneapolis: Because of the complex nature of this disease—complex mostly because of the chronicity and tendency to recurrence and because of the fact that

we are dealing with growing children—many ramifications in this matter have been discussed. We know that we must maintain proper environment for these children, that they must receive the best possible medical aid and that their education must be maintained during the convalescent period. The magnitude of this problem, in my mind, places it beyond the scope of any agency, whether governmental or private. It is becoming increasingly obvious that some aid must be given to the families of rheumatic children and to the physician who is trying to handle the cases, because of the expensive nature of any home or hospital care. The disease is difficult to handle in the home because it is almost impossible to maintain discipline and proper bed rest for the period of time necessary. It may be in this field that governmental or social aid would be of its greatest value. The various rheumatic fever programs which have been set up have proved to be of great value in the communities where they have been established. Most of them have worked on the basis of giving a temporary lift to the situation and maintain themselves only in a manner of assisting the patients over the period of his acute illness and convalescence and turning him back to his private physician. I feel that this is as it should be and that there is no need for a complete socialization of rheumatic fever cases to the extent that the private physician is eliminated from the picture; the problem is so great that any such management would be inefficient and might be deleterious to the patient and the patient-physician relationship.

DR. MAY G. WILSON, New York: I think that perhaps I can answer Dr. Paul's question by using our rates on Dr. Gibson's study. We would have expected that between 4 and 8 patients in his group would have a recurrence during the time of treatment. I have analyzed every published study, and this is the first one that would give me any reason to believe that chemotherapy prophylaxis is effective in preventing rheumatic recurrences. In the other studies to which we applied appropriate rates we found that there was no evidence of a significant difference between the treated and the control groups with the exception of one study, and in that study the control group showed bias. Our purpose in the paper we presented was not to discourage chemotherapeutic prophylaxis in rheumatic fever research but to point out that future studies must take into account the natural history of the disease. If studies are planned properly, we should have our answer to the efficacy of chemotherapeutic prophylaxis in rheumatic fever in civilian life.

DR. T. DUCKETT JONES, Boston: I think that Dr. Dwan is assuming that those interested in the development of rheumatic programs are trying to take the problem out of the hands of the physician. It is entirely a mistaken conception. It is high time that the medical profession in general assumed enough interest in the disease to develop community programs. We need not get into argument about whether or not we are going to take the thing out of the hands of local physicians: that is irrelevant. Perhaps the most pertinent of the armed service's materials so far as evaluation is concerned has been presented today. I wish that Major van Ravenswaay had not compared the rheumatic fever incidence with scarlet fever, as it is notoriously unreliable when compared with known incidences of streptococcal diseases in various parts of the country. I think there could have been a closer correlation. I can certainly agree with him in general. Until complete data of all these studies are available, I think it is foolhardy to accept the sulfonamides or any other means of prophylaxis as certain and sure. I feel that it is rather unsafe for the future of our knowledge of rheumatic fever to accept in as unequivocal a way as Dr. Thomas has data which are not completely analyzed and when she has not had an opportunity to go over everything. It may ultimately result in holding up knowledge of rheumatic fever for a good many years. I am not sure that the association between the hemolytic streptococcus index and rheumatic fever is the whole story, and I think that we must keep open minds until such time as more evidence is available. I am not against prophylaxis with sulfonamides, but I believe that their use should be distinctly experimental at the present time and not be given to everybody in the country.

DR. DAVID D. RUTSTEIN, New York: My paper was written from the point of view of the needs of the rheumatic patient. I did not say that the diagnosis could be made only by those

qualified by the specialty boards. I did state that the American Heart Association standards require the cardiac clinic director to have qualifications equivalent to those of the indicated specialty boards. Specialty board qualifications were not promulgated by public health agencies but were established under theegis of the American Medical Association. I also did not say that the general practitioner should transfer his patients to the clinic, but I did say that the clinic should offer guidance to the general practitioner in the diagnosis and treatment of his patient. The inability of the general practitioner to diagnose this disease adequately is a matter of fact and not of opinion. The data presented resulted from an analysis of 21,293 school records divided among twenty-nine school systems. In eight of the twenty-nine not one diagnosis of rheumatic fever had been made, while there was one school in which 13.1 per cent, or 1 out of every 7 pupils, were labeled as rheumatic. Other experiences support these data. Dr. Thomas's recommendations would influence the nature of the community program, but Colonel Holbrook indicated that the military experience does not necessarily apply to civilians. I should like to make three points which support that statement: 1. The medical services in the armed forces have complete control over their patients, and by giving sulfonamides to all groups the initial attack of rheumatic fever may be prevented. The civilian program must be limited to the prevention of recurrences unless sulfonamides are given to every child. 2. The armed forces have facilities for the determination of the absence of rheumatic activity. This must be determined before sulfonamide prophylaxis is inaugurated. In many civilian communities such facilities are not easily available. 3. Constant supervision of patients receiving sulfonamides is necessary; this may be difficult to accomplish in the civilian population. I agree with Dr. Jones that there is an unquestionable relationship of the hemolytic streptococcus to rheumatic fever and that the exact relationship is not clear. The evidence for that relationship is based on post hoc ergo propter hoc reasoning, and it is well to remember that thus far Koch's postulates have not been fulfilled.

MAJOR A. C. VAN RAVENSWAAY, M. C., A. U. S.: Dr. Paul inquired about the incidence of acute glomerular nephritis at Army Air Force installations in relationship to the incidence of acute rheumatic fever. We have been surprised to observe that the incidence of acute glomerular nephritis has been extremely low, although it has been impossible to get any statistically significant information. Major Frank Foster of Buckley Field tells me that during the last winter season he saw over 350 cases of acute rheumatic fever and 4 cases of acute glomerular nephritis. In regard to Dr. Jones's comments about the controls which were used in the sulfadiazine prophylaxis studies both by the Army Air Forces and by the Navy, I hope that at some future time we shall have a chance to go over with Dr. Jones the exact nature of the controls which were used and which we and others believe were quite satisfactory. In regard to the relationship of the hemolytic streptococcus to the etiology of rheumatic fever, the Army Air Forces have placed such emphasis on that because it offers one positive approach to the problem. Obviously it is much easier to do something about the hemolytic streptococcus than it is about the genetic background of individuals in high incidence areas of rheumatic fever.

DR. CAROLINE BEDELL THOMAS, Baltimore: I think Dr. Dwan and Dr. Gibson will agree that it is difficult to set up a valid experiment when working with a small group of rheumatic patients. Dr. Wilson rightly assumes that the alternate case method is best when working with large groups. We divided the control and treated groups on the basis of age and previous numbers of rheumatic recurrences so that they would roughly approximate each other. Dr. Kuttner's study at Irvington House, to which Dr. Wilson referred, certainly is the best clinical civilian study on this subject. She divided 108 children into two groups of 54 which were closely intermingled. One group was given sulfonamide prophylaxis and the other was not. Among the sulfonamide treated series, 1 developed streptococcal infection and none developed rheumatic fever. Among the controls, 37 developed streptococcal infection and 14 developed rheumatic recurrences. These results are significant and clearcut. In every such study carried out under any

circumstances, the incidence of rheumatic fever has decreased in the treated series. The studies which the armed forces are making will result in a more statistically valid series of controls than we have heretofore had. Dr. Jones, I have carefully read the original reports of the United States Navy, and the statements which I made today were based on the report of one of the largest stations, in which the controls were carried out company by company. Answering Dr. Gibson's question whether any deaths from rheumatic fever have occurred during sulfonamide therapy, 3 of the children studied in the Bellevue clinic died of advanced heart disease while receiving prophylaxis. Dr. Dodge always considered that they were given sulfonamides in a very advanced stage of the disease; whether or not there was progressive activity at the time sulfonamides were started is questionable. The patients were afebrile but had Aschoff bodies in the myocardium at autopsy. In answer to Dr. Keith, salicylates should be withdrawn during convalescence to be sure the rheumatic process has fully subsided. Later, when the condition of the patient is fully quiescent, if there is any virtue in giving salicylates together with sulfonamides I see nothing against it, although I have had no experience in that problem.

Clinical Notes, Suggestions and New Instruments

PERFORATION OF THE INTESTINE DUE TO TYPHOID

CAPTAIN AARON A. DUBROW
MEDICAL CORPS, ARMY OF THE UNITED STATES

A Negro soldier aged 25 was admitted to a battalion medical regiment hospital on Oct. 25, 1942 complaining of chills and chilly sensations, headache, abdominal pain, diarrhea alternating with constipation, nausea and vomiting, backache and general malaise. Abdominal pain was generalized. Headache was supraorbital and very severe. The patient stated that about ten days previously he had experienced an episode of diarrhea which was followed by an episode of constipation. At the time of admission he was again having a diarrhea, averaging four to eight watery stools each day, associated with some tenesmus. He denied the presence of bloody or tarry stools. He stated that he had had very little appetite the previous two weeks and on several occasions he had episodes of nausea and vomiting. He seemed to tire easily on the slightest exertion, always seeming to be fatigued, and had experienced insomnia and restlessness.

The family history was essentially negative. The past history was also negative, the patient stating that he had always been in good health. His army immunization record showed that he had received all the required vaccinations and immunizations, including typhoid, smallpox and tetanus.

The patient at the time of admission appeared moderately ill; he was well developed, and was ambulatory. He was well oriented and cooperative. The temperature was 104 F. by mouth, pulse rate 88 and respiratory rate 22 per minute. The skin was hot and dry, and there was no evidence of any rashes or skin eruptions. The pupils were equal and reacted well to light and in accommodation. There was definite conjunctival injection but no icteric discoloration. The ears and nose were normal. The tongue was coated and thick, and there was a very foul odor from the mouth. The teeth were in fairly good condition. The chest was clear on inspection, auscultation and percussion. On examination of the circulatory system the heart sounds were of good quality; no murmurs were elicited. The blood pressure was 114/80.

The abdomen was somewhat distended and tympanitic. There was generalized tenderness with some increased tenderness in the right lower quadrant. No masses or fluid wave were present. There was some tenderness in the splenic area, but the spleen was only questionably palpable.

The extremities were normal. On neurologic examination the reflexes were found to be somewhat hyperactive but were otherwise normal.

The laboratory findings at the time of admission revealed a white blood cell count of 3,500 with 60 per cent polymorpho-

nuclear leukocytes and 40 per cent lymphocytes. The urinalysis revealed the presence of some albumin, but the microscopic examination was negative.

The patient's stay in the hospital was rather stormy. His temperature rose daily to 104-105 F. with no remissions to normal, the lowest temperature being 101 F. The pulse rate ranged from 80 to 100 beats per minute and the blood pressure ranged from 100-110 systolic to 60-80 diastolic. The chest was normal at various examinations except for occasional rales at the bases. Abdominal pain and distention continued. The tenderness continued to be generalized, although there was usually some increased tenderness in the right lower quadrant. The patient became very apprehensive. He had occasional periods when he appeared to be somewhat disoriented and confused. Anorexia became even more evident. In short, he presented the picture of an acutely ill patient who was showing no progress.

Because of the limited laboratory facilities, no extensive laboratory work could be done in this forward area. His blood picture continued to show a leukopenia, the white blood cell count dropping as low as 2,000 with 50 to 55 per cent lymphocytes. The urinary picture remained essentially the same, although he began to show positive tests for varying amounts of acetone and diacetic acid. A satisfactory stool examination could not be done.

The treatment was essentially symptomatic and palliative. Sulfaguanidine had no appreciable effect. However, the diarrhea subsided, to be followed by a tendency to constipation. Quinine therapy also had no effect.

On November 2 the patient suddenly began to have very severe abdominal pain. On examination shortly after he appeared acutely ill, with hippocratic facies; he lay in bed with his knees drawn up. He was obviously in shock and

appeared to be very disoriented. The temperature had dropped to 97 F. but soon began to go up again. The pulse was rapid and thready. The respirations were shallow and increased in rate. The abdomen was decidedly rigid and with extreme generalized tenderness. At this time the patient was considered to have an acute condition of the abdomen possibly due to typhoid or one of the dysentery group of organisms.

He was given 1,000 cc. of 10 per cent dextrose in isotonic solution of sodium chloride preoperatively in an attempt to combat shock. A laparotomy was performed through a low midline incision, ether being used by the open method as the anesthesia. When the peritoneal cavity was opened free fluid of a serosanguineous nature as well as a pronounced injection of both the small and the large intestine were observed. This injection became increased as the terminal ileum was approached. The terminal ileum showed the presence of four perforations ranging from $\frac{1}{2}$ to $1\frac{1}{2}$ inches in diameter. The last perforation was about 1 inch from the ileocecal valve. About 10 inches of the ileum was resected. Because of the patient's poor condition it was thought inadvisable to perform any type of anastomosis at this time. A double barreled ileostomy was performed, a modified Mikulicz technic being used. Five grams of sulfanilamide powder was instilled intraperitoneally. The abdomen was closed tightly, no drains being used. The patient received plasma and fluids intravenously during and after the operation.

For the following three days he received 4,000 to 5,000 cc. of fluids intravenously. He began to show slow but progressive improvement. The ileostomy functioned well. His temperature dropped considerably, ranging in the vicinity of 101 F. Owing to the inadequacy of proper nursing care, evacuation to more suitable surroundings was considered advisable. On the fourth postoperative day he was evacuated to a rear zone by plane.

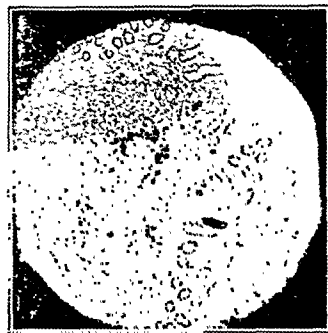


Fig. 1.—Section showing one of the ulcers with pronounced lymphocytic infiltration. This photomicrograph was taken through the eyepiece of the microscope.

Blood cultures, Widal tests and other laboratory procedures could not be done in this locality. However, various cultures and blood specimens were sent to laboratories in less forward zones. A Widal test taken on the day of operation was negative. However, a Widal test taken three days later was positive in high dilutions. A blood culture was positive for *Eberthella typhosa*. A cultured specimen as well as a smear of the ulcers revealed a pure culture of *Eberthella typhosa*. Urinary specimens were not sent for bacterial examination.

The pathologic examination of the microscopic section revealed that it was of a segment of small intestine showing one margin of a deep perforated ulcer. The mucosa and ulcer margin was sharply demarcated. The ulceration extended through all coats of the intestine. The base of the ulcer consisted of necrotic tissue, debris, fibrin and neutrophils.

The submucosa showed hyperplastic lymphoid tissue consisting mainly of lymphocytes. Also present were many plasma cells, many large mononuclear cells and scattered eosinophils. The mononuclears showed pronounced phagocytosis of tissue debris, cells and erythrocytes. A few cells were in mitosis. The muscularis was edematous and was infiltrated with lymphocytes, eosinophils, large mononuclear cells and a few neutrophils. On the serosal surface there was evidence of peritonitis. The surface was covered with an exudate consisting of fibrin, neutrophils and a few mononuclear cells.

The microscopic appearance of this lesion was compatible with the diagnosis of perforated typhoid ulcer of the intestine with peritonitis.

The differential diagnosis prior to surgery was very difficult. At the time of his admission, dengue fever and bacillary dysentery were very prevalent in the immediate and surrounding areas. The confusing abdominal picture frequently presented by other fevers and sometimes by dengue fever could not be ruled out prior to surgical intervention. Amebic dysentery was also not too common. Botulism was also to be considered, owing to the large amount of canned foods being used at that time. The acute and sometimes severe gastroenteritis and enterocolitis of undetermined etiology that were not too infrequently

The fact that the patient had received his three immunizing injections of typhoid vaccine also helped to complicate the case. Apparently the immunity accorded by the vaccines was only temporary or he had not been able to build up sufficient antibodies to afford him sufficient immunity. Had the infectious organisms been of a very virulent strain, it seemed probable



Fig. 3.—Section showing the debris, necrotic tissue, fibrin and neutrophils at the base of the ulcer.

that other members of the same unit would also have contracted the disease. All the soldiers had been using the same water sources, and no fresh milk or other fresh dairy products were available in this area. The water had been chlorinated in the usual army manner by means of a Lyster bag.

The follow-up of this case was rather interesting. Convalescence was further complicated by a bronchopneumonia. This was satisfactorily treated. The patient was transferred again to a general hospital, where an operation for a secondary closure and anastomosis was subsequently performed. As far as is known now the patient has made a satisfactory recovery.

PENICILLIN TREATMENT OF A CASE OF TULAREMIA WITHOUT EFFECT

LIFUTENANT COLONEL ALLEN I. JOSEY
MEDICAL CORPS, ARMY OF THE UNITED STATES

This case of apparently tick borne, pneumonic type of tularemia is reported with comments as to the effect of treatment with penicillin and sulfadiazine.

A soldier aged 28 years was admitted to O'Reilly General Hospital June 5, 1944, complaining of headache, malaise and fever of four days' duration. The patient's past history was entirely noncontributory. For two weeks prior to admission he had spent his furlough time on a farm in southeastern Missouri. There had been no contact with any wild animals, but he was bitten a number of times by ticks during the week prior to the onset of his present illness. On June 2 he first noticed generalized headache, weakness, chilly sensations and fever. During the following three days these persisted and he developed a slight amount of mucoid, blood tinged discharge from the nasopharynx, a slight cough and generalized aching in the chest.

On examination he appeared acutely ill, his temperature was 105 F., the pulse rate was 108 and the respiratory rate was 26.

From the Medical Service, O'Reilly General Hospital.

The laboratory reports included in this communication were done in the Laboratory Service, O'Reilly General Hospital, Springfield, Mo., and in the Laboratory of the Seventh Service Command.



Fig. 2.—Section showing the base of the ulcer with debris, necrotic tissue, fibrin and neutrophils. There is also present the pronounced lymphocytic infiltration of the submucosa as well as many plasma and mononuclear cells.

seen were also considered. No cases of typhoid or paratyphoid had been reported. There were no other similar cases in his organization or in any organization in the immediate area. As a result of all this a truly complicated picture presented itself, and up until actual surgical operation no accurate diagnosis could be made. The entire picture was made doubly difficult by the limited laboratory facilities.

There was a superficial ulceration about 0.25 cm. in diameter just above the inner portion of the right clavicle. On the anterior pillar of the right tonsil there was a similar ulcer. Neither of these ulcers was indurated or painful and there was no associated lymph gland enlargement. Over a small area at the left lung base there were a moderate number of fine and medium rales without any change in breath sounds or percussion note.

During the next twenty-two days the condition of the patient was febrile, with temperature as high as 104.5 F., which then fell by lysis during the next four days to normal. During the first three weeks he remained acutely ill. The bloody mucoid discharge from the nasopharynx subsided within seventy-two hours. Dyspnea was persistent for about two weeks, but there was only slight cough and very little mucoid expectoration. The two small superficial ulcers remained unchanged for about ten days and then healed spontaneously. At no time were there any palpably enlarged lymph glands. There was a spread of the physical signs compatible with bronchopneumonia over the entire left lower lobe and part of the right lower lobe of the lungs. On the ninth day of the disease a pleural friction developed at the left lung base followed by an accumulation of a moderate amount of fluid in the left pleural space, which was tapped on the eleventh and sixteenth days with aspiration of 60 and 350 cc. of serosanguineous fluid. As the temperature returned to a normal level there was symptomatic improvement, and by the thirtieth day of the disease the patient was gaining strength rapidly and the only apparent residual of the disease was evidence of moderate pleuritis at the left base.

The urine contained a slight amount of albumin and a few granular casts during the febrile period. There was no anemia of note at any time. The white blood cell count was 8,400 on admission and varied from 5,300 to 11,400, with a moderate increase in neutrophils during the febrile period. Repeated blood cultures were negative. Agglutination against *Pasteurella tularensis* was negative on the tenth day of the disease, but it became positive 1:40 on the eleventh day and positive 1:2,560 by the twenty-third day. It is of interest that there was an associated rise in his agglutination to *Brucella abortus* to 1:320. Fluid removed by thoracentesis on the eleventh day of the disease was injected into the peritoneal cavity of a rabbit. This rabbit died four days later and showed evidence of splenic enlargement with areas of focal necrosis. Material obtained from the spleen of the animal was injected into a second rabbit, which died five days later. *Pasteurella tularensis* was cultured from the spleen of the second rabbit, and microscopic sections of the liver and spleen of the same rabbit showed findings typical of tularemia. X-ray examinations of the chest substantiated the physical findings of the pneumonia and serofibrinous pleurisy.

Effective treatment was symptomatic and supportive in nature. The patient had been given sulfonamide by his local physician before admission to the hospital. Owing to the obscurity of the diagnosis sulfadiazine, which had been given for thirty-six hours following admission, was discontinued. On the eighth day of the disease penicillin was begun in doses of 20,000 Oxford units intramuscularly every three hours. This was continued for thirteen days with a total dosage of 1,900,000 Oxford units. Shortly thereafter the temperature curve, which had been spiked in character, became more level but the mean elevation was not reduced. There was no effect noted on the symptomatology or physical signs. On the ninth day of the disease it was decided to reinstitute sulfadiazine therapy, and sufficient drug was administered to maintain a blood level between 5 and 8 mg. per hundred cubic centimeters in the circulating blood. This also was apparently ineffectual and was discontinued on the twenty-first day.

SUMMARY AND CONCLUSIONS

A case of apparently tick borne pneumonic type tularemia ran the usual course of the disease, with fever for twenty-six days. The course of the disease was not affected by the intramuscular injection of 1,900,000 Oxford units of penicillin over a period of the eighth to the twenty-first day of the disease. Administration of sulfadiazine from the ninth to the twenty-second day of the disease was also ineffectual.

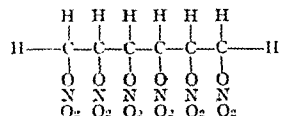
Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN E. SMITH, M.D., Secretary.

MANNITOL HEXANITRATE.—Mannitol Nitrate.—Nitromannite.— $C_6H_8O_5N_3$ M. W. 452.17.—An explosive compound formed by the nitration of mannitol, a sugar alcohol. Its stability at ordinary temperatures is such that it may be used commercially but it is distinctly less stable than nitroglycerin at 75 C. Its use for pharmaceutical preparations is only in admixture with carbohydrate substances in dilutions corresponding to 1 part of mannitol hexanitrate to 9 or more parts of carbohydrate. In such dilutions mannitol hexanitrate is non-explosive. Mannitol hexanitrate has the following structural formula:



Actions and Uses.—Mannitol hexanitrate exerts the vasodilator action of the nitrite ion (NO_2), causing a relatively persistent relaxation of smooth muscle, especially that of the smaller blood vessels. This relaxation causes a fall in blood pressure, occurring within fifteen to thirty minutes and lasting four to six hours. It also relaxes the coronary vessels and frequently provides relief from the pain of angina pectoris, although too frequent dosage may cause such a fall in blood pressure that the blood flow continues to be inadequate in spite of the vasodilatation. It has no direct effect on the myocardium.

Toxic effects include the formation of methemoglobin (which should constitute a warning concerning the use of nitrites by anemic persons), rise in intraocular tension, headache, increase in intracranial pressure and cardiovascular collapse. Treatment of severe untoward effects includes cessation of therapy with the drug, administration of oxygen, transfusions for shock, removal of drug from the stomach and other supportive measures such as lowering of the head and elevation of the limbs. Vasopressor agents should not be used in the presence of cardiovascular collapse, as they may aggravate the condition.

Dosage.—Mannitol hexanitrate may be administered in 15 to 30 mg. doses at intervals of four to six hours. Occasionally this dose may be exceeded, but careful watch of the blood pressure and the patient should be kept at all times so that the development of undesirable side effects and the patient's tolerance may be noted. The dosage should be kept at a minimum compatible with satisfactory results. Patients with extensive arteriosclerosis may not present reductions in blood pressure and, as in other instances, if no reduction occurs, medication with mannitol hexanitrate should be discontinued.

Tests and Standards.—

Mannitol hexanitrate tablets are partially soluble in alcohol and in ether (mannitol hexanitrate) and are partially soluble in water (lactose). To a powdered tablet of mannitol hexanitrate add one drop of diphenylamine test solution; a characteristic blue color is formed.

The residue obtained in the assay given below melts between 100 and 108 C. (Caution: The mannitol hexanitrate used in this test may explode on percussion. The operator must be protected by a glass screen while determining the melting point.) It is insoluble in water and soluble in alcohol and in ether. It may be recrystallized from hot alcohol in the form of characteristic long needles in regular clusters.

Transfer an accurately weighed portion of powdered tablets, containing about 0.25 Gm. of mannitol hexanitrate, to a glass stoppered Erlenmeyer flask and extract the powder with 25 cc. of ether; decant the extract through a dry filter paper into a tared dish and repeat the extraction five times; evaporate the combined filtrates to 3 cc. at a temperature not exceeding 35 C. and allow the remaining solution to evaporate spontaneously. Dry the residue over calcium chloride in a vacuum desiccator for eight hours and weigh the mannitol hexanitrate; the amount of mannitol hexanitrate found corresponds to not less than 93 per cent nor more than 107 per cent of the labeled amount.

ABBOTT LABORATORIES, NORTH CHICAGO, ILL.

Tablets Mannitol Nitrate: 16 mg. and 32 mg. Each tablet contains not less than 93 nor more than 107 per cent of the labeled amount of mannitol hexanitrate and also contains at least 9 parts of carbohydrate by weight.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO 10, ILL.

Cable Address - - - "Medic, Chicago"

Subscription price - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new, always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, OCTOBER 21, 1944

SULFONAMIDE AND PENICILLIN THERAPY IN GAS GANGRENE

The present war has renewed interest in the therapy of gas gangrene, with special emphasis on the possible efficiency of the newer chemotherapeutic agents. Bliss and her associates¹ therefore inoculated mice intramuscularly with the specific organism and tested the therapeutic value of various sulfonamides given orally or by means of local injection. None of the sulfonamides showed a high degree of activity in combating experimental *Clostridium welchi* infection, but better results were obtained with local injections than with oral administration. Sewell and his associates² made similar experiments on dogs and were also unable to abort gas gangrene with sulfonamides but were able to prolong life.

About the same time McIntosh and Selbie³ treated 24 mice within three hours after experimental infection with *Clostridium welchi* by local injection of 34 Oxford units of penicillin and reported 100 per cent survival. Following this encouraging lead, Hac⁴ and her associates of the Department of Obstetrics, University of Chicago School of Medicine, made detailed therapeutic assays of tyrothricin, zinc peroxide, sulfanilamide, sulfapyridine, sulfathiazole, sulfadiazine and penicillin, tested either alone or in combination. Mice were inoculated intramuscularly with 0.25 cc. of a 1:4 dilution of an eighteen hour brain-broth culture of highly virulent *Clostridium welchi*. With this dose most of the untreated mice showed evidence of a generalized reaction (chills, hematuria and so on) within six to eighteen hours, death occurring in about twenty-four hours in 85 per cent of the cases. Necropsy revealed an edematous hemorrhagic area frequently extending upward to

the axilla and downward to involve the entire leg. In practically all animals that survived, an extensive lesion which tended to slough persisted at the site of inoculation.

In the therapeutic test 0.25 cc. of a solution of the chemotherapeutic agent was injected either subcutaneously into the subinguinal region of the infected leg or into the opposite leg. The injection was made at varying times, such as half an hour before inoculation, at the time of inoculation or from one to three hours afterward. Of 404 untreated controls 85 per cent developed hematuria and 365 died, a survival rate of 9.7 per cent. In the parallel prophylactic test (therapy given half an hour before inoculation) the survival rate was increased to 96.6 per cent by a single 50 mg. dose of sulfadiazine and to 88 per cent by a single injection of 250 Oxford units of penicillin. Sulfadiazine was thus apparently the prophylactic agent of choice.

When the therapy was delayed till one hour after inoculation, however, the condition was reversed. The survival rate was 92 per cent with 250 Oxford units of penicillin, as contrasted with only 48.3 per cent survival with 50 mg. of sulfadiazine and 20 per cent survival with 50 mg. of sulfathiazole. When the therapy was delayed till three hours after inoculation, the survival rates were reduced to 38 per cent for penicillin and to an average of 10 per cent for the two sulfonamides. Within the limits of the experimental error, the two sulfonamides were useless in this delayed therapy, the control survival being 9.7 per cent. As a result of immediate penicillin therapy the hematuria rate was reduced to zero. In penicillin therapy delayed for one hour the hematuria rate was 42 per cent, increasing to 60 per cent if delayed two hours and to 85 per cent if delayed three hours.

Hac treated groups of mice with a single subcutaneous injection, using varying doses of penicillin given at the time of inoculation. The 9.7 per cent survival rate in untreated controls was increased to 54 per cent survival as a result of 5 Oxford units of penicillin, 73 per cent survival with 15 Oxford units and a maximum of 98 per cent with 500 Oxford units. The smallest dose of penicillin (5 Oxford units) was thus superior to the optimal dose of sulfadiazine or sulfathiazole. This superiority was shown in other ways. When treated animals died, the average period of survival was longer with penicillin than with the two sulfonamides. Penicillin was also much more effective than sulfadiazine or sulfathiazole in minimizing toxemia and tissue damage and in accelerating local tissue repair. After successful penicillin therapy the lesion at the site of the inoculation is usually healed in ten to eighteen days, as compared with twenty-two to thirty-six days after successful sulfonamide therapy. With small doses of penicillin, subcutaneous injection in the infected leg gives better results than injection into the

1 Bliss, Elcanor A., Long, Perrin H., and Smith, Dorothy G. Chemotherapy of Experimental Gas Gangrene and Tetanus Infections in Mice. *Wet Med* 1:799 (Nov.) 1941.

2 Sewell, R. L., Dowdy, A. H., and Vincent, J. G. Chemotherapy and Roentgen Radiation in *Clostridium Welchi* Infections, *Surg, Gynec and Obst* 74:361 (Feb., number 2 A) 1942.

3 McIntosh, James, and Selbie, F. R. Zinc Peroxide, Proflavine and Penicillin in Experimental *Clostridium Welchi* Infections, *Lancet* 2:750 (Dec 26) 1942.

4 Hac, Lucile R.: Experimental *Clostridium Welchi* Infection, *J. Infect Dis* 74:164 (March April) 1944.

opposite leg. With large doses of penicillin, however, local and distant subcutaneous injections are equally effective.

Encouraging as these results may be, Hac asserts that neither sulfonamides nor penicillin given alone or in combination will prove to be clinically effective in human cases unless combined with "adequate surgical procedure."

REGIONAL ILEITIS

Regional ileitis has been receiving more attention ever since Crohn and his associates¹ first described it in 1932. In a recent system of gastroenterology by Bockus,² the whole chapter is brought up to date; aside from correlated statistical data, comparatively little has been added to the original description of the disease.

Pathologists agree that the distinguishing features are: 1. Hypertrophy and thickening of the bowel wall, usually confined to some one localized stretch of the mesenteric small intestine, most frequently the terminal ileum, and varying in extent from a few inches to several feet. A bizarre feature of the disease is its occasional tendency to attack more than one segment of the bowel, leaving the intervening segments intact. The process may involve the colon down to the sigmoid. 2. Resultant narrowing of the bowel lumen. 3. Hyperplasia of the mucosa, frequently with ulceration. 4. Perforation with localized or general peritoneal involvement and the establishment of internal or external fistulas. This train of events is usually preceded by hyperplasia of lymphatic tissue and an obstructive lymphedema. Microscopically the appearance is highly mimetic of tuberculosis; but all attempts to demonstrate tubercle bacilli or any other causative organism, including the virus of lymphogranuloma venereum, have failed. The counterpart of the disease has not been observed in animals.

The diagnosis rests on symptoms so complex and varied as to create an almost invariable hazard. Crohn's original classification of symptoms is valid today, and we shall always be on safer ground if we bear in mind that the course of the disease may follow any of four patterns: (1) that of acute intra-abdominal disease, resembling most frequently acute appendicitis; (2) that of ileocolitic diarrheal disease; (3) that of chronic intestinal obstruction with supervening acute obstruction; (4) that of fistulous (external or internal) formation. Differential diagnosis demands consideration of acute appendicitis, bacillary dysentery, acute perforative peritonitis, intestinal obstruction and cancer of the bowel.

Treatment is usually surgical. If the patient is seen in the acute stage and the abdomen is mistakenly opened

for appendicitis, the consensus seems to be that the time-old maxim of "let a sleeping dog lie" should be followed and the abdomen closed without drainage. In the chronic cases the methods of treatment are either resection of the diseased segment of bowel or of side-tracking it (by ileocolostomy or by some similar procedure). Search should always be made for so-called skip areas of bowel, distant from the region under immediate surgical attack; but even if these are found and cared for adequately there are, unfortunately, an appreciable number of postoperative recurrences. Since the etiology is not known, methods of prevention are not available. In those cases in which it may be suitable to apply purely medical treatment, this should follow, in general, the lines established for the treatment of ileocolitis.

Such are the short and simple annals of a perplexingly interesting and, on occasion, a fulminantly dangerous disease. Before 1932 ileitis was unknown as a distinct entity, yet within the following seven years more than 500 cases had been reported. This reminds us that appendicitis, for all practical purposes, was unknown until after Fitz's work in 1886 and that duodenal ulcer likewise did not appear on the medico-surgical stage until the early nineteen hundreds. Curiosity is no less aroused by the present day novelty of intervertebral disk displacement. How long will regional enteritis baffle the search for its cause?

FOUR YEARS OF WAR SURGERY

Some people, including some physicians, hold the notion that the calamity of war is offset, at least partly, by war's contribution to the advancement of medical science in general and of surgery in particular. Improvements in the medical service to our wounded men in the present war are due chiefly to the principle of advanced surgical units, to more rapid ground and aerial transportation, to the use of sulfonamides, to more liberal recourse to blood and plasma transfusions and to plaster immobilization of soft tissue wounds. Major General Mitchiner¹ asserts that this improvement is not as great as one would like to believe, especially in the prevention and control of sepsis. Mitchiner says that "the self-congratulatory coma into which some of our 'specialist' colleagues have allowed themselves to lapse is almost without justification." He feels that the slightly wounded should be given precedence of treatment.

These cases constitute 60 to 70 per cent of war wounds; if promptly and adequately treated near the battle front, most of these men can be returned to the front line. In World War I a large number of wounds

1. Crohn, B. B., Ginzberg, L., and Oppenheimer, G. D.: *Regional Ileitis*, J. A. M. A. 99:1323 (Oct. 15) 1932.

2. Bockus, H. L.: *Gastroenterology*, Philadelphia, W. B. Saunders Company, 1944, vol. 2, p. 158.

1. Mitchiner, Philip H.: *Thoughts on Four Years of War Surgery—1939 to 1943*, Brit. M. J. 2:37 (July 8) 1944.

were from bullets, whereas those seen in the present war are mainly lacerated wounds of a severe type, the mortality from which is much higher. In the bombing casualties of aerial warfare some 60 per cent of the patients die either as a result of the actual injury plus blast or soon after from hemorrhage and shock due to the severity of the wound inflicted.

While admitting the great part played by the Blood Transfusion Service, Lord Mitchiner feels that there is a tendency to overevaluate blood transfusion to the detriment of older and simpler methods of resuscitation and wound treatment such as hot sweet fluids by mouth, warmth and morphine. Furthermore, the risk of septic infection from administering blood transfusion on the field of battle and in the street during an air raid is considerable. Blood or serum should not be given intravenously farther forward than the advanced dressing station on the field of battle, the sick bay when this is functioning adequately in a ship, and the first aid post during an air raid. He also feels that there is a tendency to give large quantities of blood unnecessarily and wastefully. Secondary suture of war wounds is safer and is to be preferred to primary suture. Mitchiner stresses that these principles are not new, that all emanated from the practice of surgery of the war of 1914 to 1918 and from earlier wars. Even the closed plaster technic, for which credit is given to Trueta, was practiced in the Crimean War by Pirogoff.

Infection of wounds has been much modified and the danger greatly reduced by the use of sulfonamides. However, Mitchiner warns again that excessive and indiscriminate use of these drugs is not without risk. Many patients show an idiosyncrasy to drugs of this group, while certain organisms react only to certain types. He believes that the treatment should be carried out in close cooperation with a bacteriologist. Any dose over 15 Gm. applied externally may produce toxic and even fatal results even in cases in which the fluid intake can be kept up by both intravenous and oral administration for the three days subsequent to the use of a sulfonamide. Sulfonamides, therefore, are not a panacea for all infections but may actually be deleterious and even dangerous. Their use, as a general rule, should be discontinued promptly in cases which show no constitutional improvement or fall of temperature in forty-eight hours. Penicillin, on the other hand, is not toxic and far surpasses all other antiseptics. Its action is most dramatic on the staphylococcus and gonococcus. Its use, however, may entail a drastic revision of surgery of wounds, for apparently it acts best in the presence of pus and in cases in which it is applied locally. Lord Mitchiner concludes that the surgical procedure has not altered greatly since World War I, although the type of wound has altered somewhat owing to the use of more lethal explosives and missiles.

This realistic evaluation by a competent authority is not to be construed as a confession of disappointment or failure but rather as a timely warning against the dangers of complacency and wishful thinking.

Current Comment

EFFECT OF TRAVEL ON THE INCIDENCE OF ABORTION

Diddle¹ reports a study on the incidence of abortion among a group of pregnant women who journeyed and a group who maintained a sedentary existence during the period of gestation. The particular naval hospital and dispensary from which the data were collected served all obstetric dependents of the Navy, Marine Corps, Coast Guards and Army personnel. The geographic position of the clinic was particularly favorable to this type of study. The area concerned is an island 127 miles away from the mainland of the Continental United States and is connected with the latter by means of a rough asphalt and coral highway and a system of bridges. The road in places is corrugated with transverse humps. In order to commute to and from the nearest railroad, 170 miles away, it was necessary for all women to go by bus or car over this course. For a period of observation limited to sixteen weeks there were 289 women who journeyed and 467 who did not. A smaller group, in which 200 women did not journey and 110 did, permitted observation month by month for a longer period. Of the 289 travelers who toured before the end of the fourth month 16, or 5.6 per cent, had untimely births as contrasted to 84, or 17.9 per cent, occurring among the control or sedentary series. Based on the 179 protocols where the distances covered were known definitely, 46 (25.7 per cent) were multigravidas and 37 (20.6 per cent) parous. A careful analysis of all the factors involved suggested to the author that neither the distances covered and the method of travel nor the time of the month at which a journey was taken revealed any significant differences in the incidence of abortion. The results of these observations, although involving a small group, suggest that travel by car or bus over the rough stretch of highway covering the keys and over modern roads and by train in the states did not increase the incidence of abortions among travelers as opposed to nonjourneying women. Transportation alone probably did not predispose to abortion, except in 1 case in the series: the woman had ridden a motorcycle a few hours previously. Journeying perhaps had facilitated an interruption of gestation where intrinsic and extrinsic factors were already in action. The principal argument against traveling is that it entails the possibility that an expectant mother may need medical care wherever trouble may arise and with such resources as are present.

1. Diddle, A. W.: The Effect of Travel on the Incidence of Abortion, *Am. J. Obst. & Gynec.* 48: 354 (Sept.) 1944.

MEDICINE AND THE WAR

ARMY

BRIG. GEN. LEON A. FOX RECEIVES TYPHUS COMMISSION MEDAL

Brig. Gen. Leon A. Fox has been awarded the Typhus Commission Medal for his work as director and field director of the United States of America Typhus Commission in the Middle East and Mediterranean areas, and specifically for his direction of the Typhus Control Project of Naples in December 1943, which brought that epidemic under control within a month. The citation accompanying the award reads "For exceptionally meritorious service rendered first as director and later as field director of the United States of America Typhus Commission. In charge of the commission's activities in the Middle East and North Africa since March 1943, General Fox increased the extent and value of investigations and control of typhus fever in Egypt and in other Mediterranean countries. In positions of high responsibility his opinion and counsel had important influence on both medical affairs and international relationships. On missions to London he further cemented and strengthened British and American effort and policy for operation with civil affairs in this country and abroad. In December 1943 General Fox was placed in charge of the campaign against the outbreak of typhus fever at Naples, at a time when the disease had reached epidemic proportions and was a threat to military operations. Securing full cooperation from military and civilian agencies, he organized a vigorous attack on the disease, employing all the modern principles and methods for combating typhus. So effective was the work done under General Fox that the epidemic was brought under control within a month. The achievement in controlling this epidemic of typhus at Naples and in southern Italy ranks as one of the greatest triumphs of modern preventive medicine." Dr. Fox graduated from the University of Cincinnati College of Medicine in 1912 and has been in the service since June 1917.

THREE EGYPTIAN HEALTH OFFICIALS HONORED FOR TYPHUS WORK

The War Department announced recently the award of the United States of America Typhus Commission Medal to three Egyptian health officials for their cooperation with our scientists in the study of typhus fever. The citation of Dr. Ali Towfik Shousha, under secretary of state for health of the Egyptian government, reads:

"For meritorious service in connection with the work of the United States of America Typhus Commission. From the time of the arrival of the commission's group in Cairo early in 1943, Dr. Shousha has taken great personal interest in the activities of the commission. He has entered wholeheartedly into the cooperative projects which have been established. Through his sound advice and administrative capacity he has furthered all the investigations and control work done by the commission in Egypt."

The following is the citation of Dr. Abdel Hamid Sadek, director of the section for epidemic diseases of the Egyptian government health department:

"For meritorious service in connection with the work of the United States of America Typhus Commission. By his interest and tireless efforts Dr. Sadek greatly facilitated the whole program of field investigations and the control of typhus fever in Egypt. From these activities, information and experience were gained for the improvement of epidemic typhus control in all areas."

The citation of Dr. Mahmoud Abou-Demerdash, director of the Egyptian government hospital for infectious diseases, is as follows:

"For meritorious service in connection with the work of the United States of America Typhus Commission. Through the interest and cooperation of Dr. Demerdash, wards and labora-

tory buildings were made available to the United States of America Typhus Commission at the Fever Hospital in Cairo in 1942. As the clinical and laboratory investigations increased with the encouragement and aid of Dr. Demerdash, improved facilities were provided at this hospital in 1944. Dr. Demerdash has taken great personal interest in the work of the members of the commission with patients suffering from typhus fever. He has given expert advice and training based on his experience with the disease and has materially aided the commission's study of typhus fever in Egypt."

LIMITED SERVICE OFFICERS EXAMINED FOR OVERSEAS DUTY

Because of the urgent need for Medical Corps officers for overseas assignment, a survey is being made of all those in the army service forces who are now on permanent limited service with a view to their possible reclassification. Many, it is felt, can be assigned to communication zone installations overseas, where they can perform duties similar to those in the zone of the interior. Medical Corps officers will not be considered disqualified for overseas service if they can be expected to render effective professional service without appreciable risk of aggravating physical defects or if they have histories of defects which are not demonstrable and have not resulted in hospitalization while in service.

ARMY'S RECONDITIONING PROGRAM MAY INFLUENCE CIVILIAN HOSPITALS

Major Henry B. Gwynn, of the Reconditioning Division of the Office of the Surgeon General, recently stated that the strides being made in the operation of the Army reconditioning program will probably lead to radical changes in the civilian hospital of the future. Civilian hospitals, capitalizing on the progress made by the Army's reconditioning program, will probably include motion picture theaters, gymnasiums, public address systems and areas for physical and occupational therapy in their buildings of tomorrow. Anticipating the objection of increased costs in such a program, it was pointed out that the Army is finding that hospitalization time is curtailed from 10 to 33 1/4 per cent as a result of reconditioning. If this estimate holds true even to some extent in civilian practice, Major Gwynn stated, the lower incidence of complications and the shortened convalescence at home before resuming normal activities will more than pay the additional cost.

The prospects for the adoption of this reconditioning program by civilian hospitals will depend on public opinion and the attitude of the medical profession, Major Gwynn said, and ideas which have been in vogue for several hundred years will be changed only when the facts justify it.

FIVE HUNDRED MEN COMMENDED FOR PART IN TESTS OF NEW GAS OINTMENT

Five hundred officers and enlisted men were recently commended by the Chemical Warfare Service of the Army Service Forces for voluntarily exposing themselves to lethal gases in order to test a new anti-gas protective ointment. As a result of these tests, during which men entered gas filled chambers and contaminated areas, medical officers and research scientists have conclusive evidence that the M5 protective ointment, or "gasproof makeup kit," will be effective in the event that the enemy resorts to gas warfare. The commendation stated that the men "participated beyond the call to duty by subjecting themselves to pain, discomfort and possible permanent injury for the advancement of research in protection for our armed

forces." Among the volunteers were 40 soldiers of Japanese ancestry now serving with United States forces.

The men subjected to the gas chamber tests were protected by gas masks and liberal quantities of the new ointment. Others tested the substance by entering ground areas which had been contaminated with lethal agents. In order to minimize the danger to the personnel, tests were made only after exhaustive experiments with the ointment. None of the volunteers suffered any ill effects.

CIVILIAN NURSES NEEDED FOR ARMY HOSPITALS

Registered nurses who are professionally but not otherwise qualified for commissions in the Army Nurse Corps are needed for employment under Civil Service in army hospitals.

Registered nurses more than 45 years of age who are not physically qualified for commissions or whose home responsibilities prevent them from applying for commissions are eligible for these positions.

Urgent need for commissioned nurses in the overseas theaters, where their skill often means the difference between life and death for an American soldier, has resulted in a shortage of qualified nurses in hospitals in this country. Simultaneously, increased numbers of patients are being sent back to this country from the battle fronts.

Civilian nurses wishing to avail themselves of the opportunity for service in army hospitals may work in hospitals near their homes. They may live in government quarters or may reside at their homes, provided adequate transportation is available to and from work. Working hours for civilian nurses in army hospitals often are longer than the standard forty-eight hour week. The salary is \$2,190 a year, on a forty-eight hour week basis, but, if circumstances require overtime employment, additional pay may be authorized.

Qualified nurses interested in this type of employment can get full information at the army hospitals nearest their homes. Employment will be completed through Civil Service channels.

SEVERAL HUNDRED DENTAL OFFICERS TO BE RELIEVED FROM ACTIVE DUTY

A recent announcement by the War Department stated that several hundred dental officers will be relieved from active duty with the Army shortly, permitting their return to private practice. The following priority is established for the release of officers in replacement pools or elsewhere whose services can be spared:

1. Officers not physically capable of doing a full day's duty operating at a dental chair.
2. Limited service officers requiring special consideration as to climate, diet or type of work or who are qualified for assignment in the United States only.
3. Officers whose relief from active duty can be accomplished under current War Department policies governing officer personnel generally.
4. Officers selected by the Surgeon General who can be released with least detriment to the service. This category will be used, after exhausting all others, to make up the number required to be released to reduce an existing surplus of dental officer personnel.

ARMY HOSPITALS MAY EMPLOY NURSES BEFORE COMMISSIONING

Graduates of the U. S. Cadet Nurse Corps who have taken their Senior Cadet period in army hospitals and who have applied for commissions in the Army Nurse Corps may be hired as civil service appointees by army hospitals subject to the law of the state in which each hospital is located. Appointments will not exceed six months' duration. This step has been taken because of the shortage of qualified nurses and of the delay in commissioning due to the fact that state board examinations, a prerequisite for a commission, are frequently not given for some time after the graduation date.

MAJOR TEGTMEYER NAMED MOST CITED DOCTOR

Major Charles E. Tegtmeyer, formerly of Hamilton, N. Y., five times decorated by the Army Medical Corps, has been named the most frequently cited former staff member of New York's voluntary hospitals. In nearly three years of service Dr. Tegtmeyer has been in the North African, Sicilian and Italian campaigns. Twice wounded in action, he is the recipient of the Purple Heart, Bronze Star, Silver Star, Legion of Merit and Distinguished Service Cross "for conspicuous gallantry in rescuing and saving the wounded." Dr. Tegtmeyer graduated from Columbia University College of Physicians and Surgeons, New York, in 1935.

FIRST PHYSICAL THERAPIST AWARDED LEGION OF MERIT

First Lieutenant Metta L. Baxter, PT, of Los Angeles, now stationed with the 21st General Hospital in Italy, is the first physical therapist to be awarded the Legion of Merit. Her citation reads "for exceptionally meritorious conduct in the performance of outstanding service." Lieutenant Baxter is a graduate of Kansas State College, Manhattan, and received her physical therapist certificate from the Army Medical Center, Washington, D. C.

CAPT. ROBERT E. WOLF MISSING IN ACTION

Capt. Robert E. Wolf, formerly of Shreveport, La., has been reported missing in action since August 10. Dr. Wolf has been a battalion surgeon and has been in the army for two years. He went overseas last October. Dr. Wolf graduated from the University of Arkansas School of Medicine, Little Rock, in 1940 and entered the service Aug. 22, 1942.

FLIGHT SURGEONS' ASSISTANTS

A class of seventeen flight surgeons' assistants completed the six weeks course in aviation medicine at the School of Aviation Medicine, Randolph Field, Texas, September 15. These men are trained as specialists in assisting flight surgeons in the selection, care and maintenance of the flier. Brig. Gen. Eugen G. Reinartz, U. S. Army, is commandant of the school.

ARMY AWARDS AND COMMENDATIONS

Major Albert J. Bajohr

The Bronze Star Medal was recently awarded to Major Albert J. Bajohr, formerly of Flushing, N. Y. His medal was won on Bougainville, where battle surgery was performed night and day in an underground hospital. Dr. Bajohr graduated from George Washington University School of Medicine, Washington, D. C., in 1933 and entered the service April 2, 1941.

Captain Vincent S. Cunningham

For his gallant conduct in combat at Humboldt Bay, Dutch New Guinea, Capt. Vincent S. Cunningham, formerly of Long Island, N. Y., was awarded the Silver Star. The citation accompanying the award read "As a result of enemy bombing an ammunition and supply dump was set afire. With utter disregard for his own personal safety, and constantly in danger of being hit by shrapnel from exploding ammunition, Captain Cunningham set up an aid station near the fire and labored all night and until the next afternoon taking care of and gathering all casualties that could be collected." Dr. Cunningham graduated from New York University College of Medicine in 1935 and entered the service in June 1942.

Captain Fred A. Dry

The Silver Star was recently awarded to Capt. Fred A. Dry, formerly of Allentown, Pa. His citation reads "During the initial days of combat, severe casualties were sustained from German fire. During this time Captain Dry worked incessantly

to ease the treatment and removal of the wounded. Refusing suggestions that he remove his first aid station to a place of safety, he performed his duties as close to the front lines as possible. On several occasions, although he had not slept for days and with utter disregard for his own safety, he evacuated wounded from exposed front line positions and entered dangerous areas rather than order his men into areas subjected to heavy enemy fire." Dr. Dry graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1941 and entered the service in July 1942.

Major Dalton C. Hartnett

The Legion of Merit was recently awarded to Major Dalton C. Hartnett. The citation accompanying the award reads "He performed outstanding services as Flight Surgeon, 3d Photographic Mapping Squadron, from Feb. 20, 1943 to March 28, 1944. During this period, while serving the squadron on three continents in zones ranging from the arctic circle to the tropic of Capricorn, he maintained the health of the command at a very high level. He planned and personally conducted courses of instruction for the prevention of disease and the preservation of health. His untiring vigilance, initiative and personal check of all individuals of the command, by day and by night, resulted in maintaining 98.3 per cent of the unit available for duty." Dr. Hartnett graduated from St. Louis University School of Medicine in 1940 and entered the service June 30, 1941.

Major Jay Paul Roller

The Oak Leaf Cluster to the Silver Star was recently awarded to Major Jay Paul Roller, formerly of Luckey, Ohio. The citation accompanying the award reads "In Sicily in August 1943 a part of the Regimental Communications Section was sent forward to establish an advance communications switch. The leading vehicles of the convoy were hit by enemy artillery fire and mines, killing four and severely wounding eight of the

enlisted men riding in front vehicles." Major Roller was called and went forward to the area being subjected to heavy enemy artillery and mortar fire to administer medical aid to the eight wounded soldiers. During the course of this outstanding devotion to duty he lost several of his own medical personnel as the result of German S mines. Notwithstanding this he continued on to the completion of his tasks throughout the night. On this occasion and countless others he demonstrated such gallantry and disregard for self in the performance of hazardous missions that his courage and devotion to duty are a constant inspiration to the officers and men of his regiment." The citation accompanying the Silver Star award appeared in THE JOURNAL Dec. 4, 1943, page 908. Dr. Roller is a graduate of the University of Louisville School of Medicine, 1939. He entered the service Jan. 5, 1941.

Captain Byrne M. Daly

Capt. Byrne M. Daly, formerly of Jackson, Mich., was recently awarded the Bronze Star for "meritorious service in actual combat while serving with the third (Marine) division on the Fifth Army front in Italy." The citation which accompanied the award read "Capt. Daly served as battalion surgeon without an officer assistant and was further handicapped throughout the campaign by a shortage of technicians and litter bearers as well as by cold, rainy weather and difficult mountainous terrain. Although ill, he refused to rest and continued to render invaluable service to his organization in the treatment and evacuation of many casualties. His accomplishments of difficult tasks was the result of his skill, initiative and devotion to duty." Dr. Daly was previously awarded the Purple Heart for wounds received in September 1943 during action at Salerno. He has been overseas since October 1942 and took part in the North African campaign as well as the Italian fighting. Dr. Daly graduated from Wayne University College of Medicine, Detroit, in 1942 and entered the service on July 1 of that year.

MISCELLANEOUS

THE RED CROSS HOME NURSING PROGRAM

Through its home nursing classes the Red Cross is attempting to develop self reliance in the homemaker in handling simple illnesses in the home and in understanding the need for expert medical and nursing assistance in cases of a more serious nature. The homemaker who has had only simple training in home nursing can help the doctor by learning to recognize early symptoms of illness, by observing and by recording for his information such details as the elevation of temperature, the appearance of a skin rash or the presence and intensity of pain. She learns to carry out his orders intelligently, how to keep the patient comfortable and clean, how to fill a hot water bottle and how to use it, how to give an enema, apply a compress, prepare a special diet and carry out communicable disease technic without time consuming questions. She learns to use the telephone intelligently, to report information clearly and calmly, to call as early in the day as possible so he can arrange his schedule of calls.

The Home Nursing course differs from the Volunteer Nurse's Aide course, which is designed to prepare women to assist professional nurses in caring for illness in hospitals, clinics and dispensaries. The course also should be distinguished from courses for "practical" nurses whose services are on a paid basis.

The standard Red Cross Home Nursing course is primarily a homemaker's course in simple nursing skills—intelligent home-making applied to the care of the sick in the home and to family health. It gives information about a safe home environment, including the necessity for a pure and efficient water supply, safe milk and food, screening, ventilation and waste disposal. It inculcates an interest in the general public health and its inevitable relationship to the health of the home. It awakens responsibility for supporting the health officer in his efforts to safeguard the community.

The course is taught, usually on a volunteer basis, by nurses who meet Red Cross qualifications in both professional and

general education. Although based on the Red Cross Home Nursing textbook, the content of the standard course is flexible and easily adapted to various age groups and their needs. The four types of courses designed for men, women and school age young people are:

First, the standard course, which requires not less than twenty-four hours for adult community groups. It includes the various phases of home nursing care. Second, a new streamlined course titled "Six Lessons in Care of the Sick," requiring twelve hours. It is designed for very busy, hard to reach adult groups and covers only the basic procedures in home nursing. Only instructors who have been authorized through a special training course may teach the Six Lessons. Third, the School course, for high school students. This may be given to school or out of school groups. Fourth, a College Course in Home Nursing and Family Health, now in preparation. It is intended for college students or others prepared to work on the college level.

Nurse-instructors spend approximately half of the class time on demonstrations and on supervising the practice of simple procedures, the other half on class discussions of problems. A small certificate, in recognition of the satisfactory completion of the course, is given. This does not imply that the holder is qualified to work for pay outside her home. However, in cases of emergency, or when the home nurse has time for volunteer service, she may assist community health agencies that need her and that are able to provide additional instruction and supervision.

The Red Cross Home Nursing textbook is the basic text for all adult courses and also serves as a permanent reference book in the home. The School Edition is used for the school course. The book has been translated into Spanish for the use of Spanish speaking people both in this country and in Latin America.

Home Nursing is one of the oldest programs of the American Red Cross. In 1908, three years after the Red Cross was chartered by Congress, the idea was originated for this plan of health education for the homes of the country. The program

has gathered impetus with the years. Particularly during the period of war and rehabilitation it is important because of the continued decrease in medical facilities available to civilians. The large number of wounded and disabled men being returned to this country will continue to make the problem acute. In addition, the mass grouping of people, the shifting of large populations because of employment reasons, may lead to an increase of communicable disease and to epidemics that will require the assistance of a citizenry trained in simple skills in caring for the sick in the home.

The Red Cross Home Nursing program is aiming to reach 3,000,000 persons estimated as the minimum additional number who should be trained in these simple skills. That figure has been based on a careful study of the estimated number who may be ill at given times in the homes of America. It has been found that it is usually women between the ages of 15 and 59 who normally care for the sick at home. Excluding those who already have been trained in home nursing, as nurse's aides or as professional nurses, it is estimated that the number still needed to insure safe nursing care would be at least 3,000,000.

How can the doctor help the Red Cross to reach the right persons? By asking who in his patient's family has had a home nursing course and by expressing appreciation to those who have demonstrated the value of the course; by directing prospective students to the Red Cross chapter for information about classes; by urging professional nurses—including housewives and others inactive in nursing—to arrange time for teaching classes (26,000 nurses are needed this year as instructors); by participating in the institutes for nurse-instructors and making recordings for local radio programs; by discussing home nursing at medical meetings, perhaps inviting a Red Cross Home Nursing committee member to explain the program; by speaking at closing class exercises (educational films on immunization or other appropriate subjects may be shown at such times); displaying the textbook, posters and dodgers on Red Cross Home Nursing in his office and including a dodger or statement on home nursing with his bills; urging the support of classes by various women's auxiliaries and other groups interested in health; calling attention to the Red Cross Nursing textbook as a valuable guide for the homemaker, even though she may not be able to attend the home nursing class.

The Red Cross is eager to help overworked doctors and professional nurses in these trying times by providing understanding people in the homes where sickness strikes. It asks the help of the medical profession in making a success of its home nursing program.

ARMY PSYCHIATRIST ASKS COOPERATION OF INDUSTRY

Lieut. Col. Malcolm J. Farrell, deputy director of the Neuropsychiatry Consultants Division of the Office of the Surgeon General, in speaking before the industrial relations conference of the American Management Association in New York City recently, stressed the need for industry to give employment whenever practicable to men disqualified for military service for psychiatric reasons. Dr. Farrell deplored the popular misunderstanding of psychiatric conditions and especially confusion over the meaning of the term psychoneurosis. Up to 80 per cent of the men who have become psychiatric casualties in combat, he said, have been cured when their cases were properly recognized and treated. Many others who cannot continue to perform some type of army duty and those who have been eliminated early in their training periods are capable of performing useful work as civilians.

FIRST NURSES TO SCHOOL OF MILITARY GOVERNMENT

Capt. Grace Alt, Fort Meade, Md., and Capt. Mildred Lucka, McCloskey General Hospital, Texas, both of the American Nurse Corps, have been selected as the first nurses to attend the School of Military Government at Charlottesville, Va., to qualify for assignment to the Civil Affairs Administration in the Far East.

MUSTERING-OUT PAYMENTS OF DISCHARGED ASTP STUDENTS

In reply to an inquiry concerning the discharge of premedical and medical students, the following was received from the Office of the Fiscal Director, September 21: "ASTP premedical and medical students, also premedical and dental students, are not to be regarded as discharged because of importance to the national health safety or interest so as to preclude payment of mustering-out payment where otherwise qualified."

CIVILIAN INSECT CONTROL PROGRAMS AFTER WAR

At the end of the war the United States will be in an extremely favorable position to wage a major campaign against disease-carrying insects as a result of the tremendous effort the Army has made to defeat them in combat areas throughout the world. Efficient methods of insect control have been worked out and thousands of men have been trained in the techniques developed. The men and the methods will be available for mosquito and other insect control programs, once peace and victory are achieved. They will make possible renewal of civilian efforts to eliminate the nuisance of the mosquito and at the same time guard against the diseases the mosquito is known to transmit, such as malaria, dengue and yellow fever and perhaps encephalitis. The Army also developed new insect repellants, effective not only against mosquitoes but also against mites, fleas and other insects known to be disease carriers.

Among the new weapons to be available to civilians after the war will be DDT, the new chemical insect killer, with which the Army solved the problem of typhus in Italy by destroying the body lice which transmit the infection. DDT is used in the Army in heavy oil solution for spraying on water or in light oil solution for spraying on walls and furniture. It is as effective against mosquitoes as it is against lice.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Mayo General Hospital, Galesburg, Ill.: Laboratory Diagnosis and Its Relationship to Treatment, Drs. William S. Hoffman and Steven O. Schwartz, November 1.

Camp Ellis, Camp Ellis, Illinois: Symposium on Organic Neurology, Drs. Francis J. Gerty and Loren William Avery, November 1.

Chanute Field, Rantoul, Ill.: Chronic Chest Diseases and Diseases of the Larynx, Drs. Paul H. Holinger and Henry C. Sweany, November 1.

Schick General Hospital, Clinton, Iowa: Medical Rehabilitation, Dr. Frank H. Krusen, October 27.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, October 14, p. 440)

COLORADO

Colorado General Hospital, Denver. Capacity, 270; admissions, 3,718. Dr. Maurice H. Rees, Medical Superintendent (intern).

IOWA

Mercy Hospital, Des Moines. Capacity, 193; admissions, 5,357. Sister M. Anita, Superintendent (interns, residents).

NEW YORK

St. John's Long Island City Hospital, Long Island City. Capacity 284; admissions, 5,418. Sister Thomas Francis, Superintendent (interns).

WEST VIRGINIA

St. Mary's Hospital, Clarksburg. Capacity, 192; admissions, 4,201. Sister M. de Sales, Administrator (2 residents—mixed service).

ORGANIZATION SECTION

WASHINGTON LETTER

(From a Special Correspondent)

Oct. 16, 1944.

Action to Limit Production of Opium

The Department of State reveals that U. S. government missions abroad have been instructed to urge on governments of the chief opium producing countries that steps be taken to limit opium growth and production. While this action is motivated from the point of view of international well-being, the presence of American troops throughout the world makes the control problem a matter of concern in many American homes. The official move by the government was taken following passage by Congress early this summer of a resolution by Representative Walter H. Judd (Republican, Minnesota), long time Far East medical missionary, which called on the President to ask action to limit production to medicinal and scientific requirements "in the interest of protecting American citizens and those of our allies and of freeing the world of an age old evil." U. S. missions will transmit a copy of the Judd resolution to Afghanistan, China, Great Britain (for India and Burma), Iran, Russia, Turkey and Yugoslavia. So far Yugoslavia is the only country to receive the communication.

It is revealed here that United States ships carrying lend-lease goods for Russia and manned by American seamen are

touching port every day in Iran, largest producer, where 50 to 75 per cent of the police force is said to be addicted to the drug habit. Many American and United Nations citizens are in Iran, and American soldiers are also in India and Burma, large producers of opium.

The United States is thus assuming leadership in opium control for the second time, having called the first international commission in 1909. The Judd resolution is described as the first step in present plans. The nation can exert pressure at this time on opium producing countries which are dependent on the United States for money, materials and men. National economies, once dependent on opium production in some instances, are now looking to lend-lease for materials and money in development of railways, highways and factories.

Representative Judd points out that when he proposed his resolution the opium revenue in British, Dutch and French Far East possessions ranged from 2 per cent of income in the Dutch East Indies up to 20 per cent in the British Straits Settlement colony, including the island of Singapore. A hopeful development in the situation is the promise that was made by the British and Netherlands governments in November 1943 to prohibit the use of opium for smoking and to abolish opium monopolies in Far East territories when the Japs have been removed.

MEDICAL ECONOMIC ABSTRACTS

PROGRESS OF MEDICAL SERVICE PLANS

To form a basis for mutual comparison, the various medical society prepayment plans were asked by the Bureau of Medical Economics for as recent a financial report as it was possible to give. Some of the principal items of the reports received are given here. Copies of these reports in full are available for administrators of all existing and proposed plans.

Colorado Medical Service, Inc.—This was organized May 1, 1942 to serve metropolitan Denver and offers only a surgical contract. On March 1, 1943 it had about 5,000 members. On Sept. 30, 1943 it had received \$17,856.20 income from subscribers and had an operating expense of \$16,568.75. Its balance showed a surplus of \$10,914.72.

Dallas County Medical Plan.—This was organized in 1940 to serve Dallas County and offers both medical and surgical contracts. On Jan. 1, 1944 it had 167 medical contracts and 24 surgical contracts. Its income was \$6,951.25 and its total expense \$4,960.23, leaving a net gain of \$1,991.02. It had resources of \$9,713.98 and a surplus of \$1,991.02.

Group Hospital Service, Inc.—This was organized in 1943 as a plan for medical care sponsored by Group Hospital Service and serves the state of Delaware. It offers its contracts only in the form of a surgical service rider, issued only to subscribers to a hospital service plan. On Dec. 31, 1943 it had a total of 4,622 males and 6,166 females, including subscribers and dependents. On Dec. 31, 1943 it had received as income from subscribers \$25,011.45, expended \$8,700.52 and has a reserve of \$16,310.93.

Hospital Saving Association of North Carolina, Inc.—This is a combination hospitalization and surgical plan, and the financial figures cover the combined operation. The hospitalization contract covers 66,162 males and 90,886 females. The surgical plan covers 13,535 males and 16,638 females. The total income from all subscribers for the period from Dec. 31, 1943 was \$932,587.38. The plan as a whole now has a surplus of \$311,703.30.

Massachusetts Medical Service.—The plan was organized in July 1942 and serves the state of Massachusetts. It offers a contract covering surgery, obstetrics, x-ray and anesthesia. On Dec. 31, 1943 it had a membership of 9,678 males and 11,306 females. During 1943 it received an income from subscribers of \$41,949.78, of which it expended \$12,045.36. On March 29, 1944 it had a surplus of \$37,045.36.

Medical Service Association, Inc.—This was organized in 1940 and serves fourteen counties in North Carolina. It is operated only jointly with the local hospital service plan, with the medical contract on an indemnity plan. The membership of Oct. 30, 1943 was 13,031. Income to April 18, 1944 was \$53,317.16. Of this amount \$45,734.39 was spent for medical services and \$4,775.96 for operating expense; \$2,244.69 remains in the treasury. There is an operating reserve of \$562.12.

Medical and Surgical Care, Inc.—This was organized in 1941. The original plan was changed somewhat in May 1942. It serves fifteen counties in central and northern New York. It offers its surgical contract with a medical rider operative only after the first two calls of any illness and allows credits on the patient's bill. About 19,200 persons are now enrolled for the ten months ended Oct. 31, 1943. There was a total income of \$111,851.14; disbursements amounted to \$94,906.09, and the plan has a surplus of \$15,320.71.

Michigan Medical Service.—The first contract was issued March 15, 1940. The plan serves the state of Michigan, and at present its contracts are entirely surgical. On Dec. 31, 1943 it had a total of 467,717 subscribers and dependents. Its income during 1943 was 3,367,372.95. During that year the total disbursements were \$3,063,837.62, showing a total gain of \$303,535.33. It has now accumulated a reserve of \$136,242.71.

Western New York Medical Plan, Inc.—This was organized in March 1940 to serve six counties in western New York and offers medical-surgical contracts. It has 7,602 male and 7,437 female medical-surgical contracts, and 2,339 male and 2,711 for female surgery only. Its total income up to Dec. 31, 1943 was \$119,275.93. Of this it expended \$103,796.96 and has accumulated a surplus of \$8,286.88.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Dr. Jacob C. Geiger, San Francisco, on October 14 received the honorary degree of doctor of science from Tulane University of Louisiana School of Medicine, New Orleans. Dr. Geiger gave the commencement address on this occasion. Dr. David E. Smallhorst, Glendale, health officer for the San Fernando District, has retired under civil service rules. He has been connected with the Los Angeles County Health Department since 1926.

Court Orders Restoration of Physician's License.—The state district court recently upheld a superior court verdict ordering restoration by the state board of medical examiners of the license of Dr. Thomas D. Wyatt, Redding, newspapers reported August 10. The license had been revoked by the board when it charged Dr. Wyatt with performing two illegal operations at a Redding hospital in March 1942, it was stated (THE JOURNAL, June 26, 1943, p. 629). The women involved testified in superior court that the operations were legal.

Position Open in San Diego.—The department of civil service and personnel of the County of San Diego announces a vacancy in the position of assistant director of public health of San Diego County. Applicants must be citizens of the United States, have a license to practice medicine in the state, have two years of successful experience in a recognized department of public health and present a certificate or degree from a recognized school of public health. The salary is between \$405 and \$422 a month. Additional information may be obtained from Room 212, Civic Center Building, San Diego 1.

GEORGIA

Personal.—Dr. John P. Kennedy recently retired as health officer of Atlanta, a position he held for forty-three years.

New Professor of Pediatrics.—Dr. Roger W. Dickson was recently appointed professor and chairman of the department of pediatrics at Emory University School of Medicine, Atlanta. Dr. Dickson was also made chief of the pediatric service in the Grady Hospital, Atlanta.

Building Planned for Georgia Medical School.—A new building to cost approximately \$200,000 will be constructed for the University of Georgia School of Medicine, Augusta, when the war is over to take the place of the old college building, according to Dr. G. Lombard Kelly, dean. The old building will be converted into a student union, housing a swimming pool, gymnasium, restaurant and recreation rooms.

INDIANA

Changes in Health Personnel.—Dr. Clarke Rogers, Indianapolis, has been appointed a member of the Indianapolis Board of Health to succeed Dr. Arthur F. Weyerbacher, resigned. Dr. Stephen C. Bradley has been placed in charge of the department of contagious diseases of the Terre Haute board of health, succeeding the late Dr. Maurice B. Van Cleave.

Dr. Page Goes to Cleveland Clinic.—Dr. Irvine H. Page, for seven years director of the Eli Lilly Laboratory for Clinical Research and the Lilly Clinic, Indianapolis, has resigned to become director of research for the Cleveland Clinic, Cleveland, effective January 1. Dr. Kenneth G. Kohlstaedt, assistant superintendent of the Indianapolis City Hospital, will succeed Dr. Page.

IOWA

First Annual Meeting on Mental Hygiene.—The Iowa State Society for Mental Hygiene, which was organized during the past year with Dr. Walter L. Bierring, Des Moines, state health officer, as president, will hold its first annual session at the Hotel Kirkwood, Des Moines, October 28. Among the speakers will be Major S. O. Meisner on "Problem of the Constitutional Psychopath"; Luther E. Woodward, Ph.D., New York, "Social Adjustment of Returning Veterans," and Mr. Everett S. Elwood, president, American Occupational Therapy

Association, Philadelphia, "Occupational Therapy in War and Postwar." A panel discussion on "Mental Hygiene: Postwar will be conducted by Ralph H. Ojemann, Ph.D., Iowa City; Dr. Andrew H. Woods, Iowa City; King Palmer, Iowa Board of Social Welfare, Des Moines; Marjorie O. Lyford, R. N., Des Moines, and Dr. Robert L. Jackson, Iowa City.

KENTUCKY

Changes in Health Personnel.—Dr. Don E. Wilder, Grayson, has been named health officer of Breathitt County. Dr. Wallace Byrd, Williamstown, has resigned as health officer of Grant County. Dr. William L. Wright, Louisville, has been placed in charge of the Bell County Health Department, Pineville. Dr. Charles J. Grubin, Arlington, Va., has been named health officer of Madison County with offices in Richmond.

State Medical Election.—Dr. J. Watts Stovall, Grayson, was chosen president-elect of the Kentucky State Medical Association at its annual meeting in Lexington and Dr. Oscar O. Miller, Louisville, was inducted into the presidency. Other officers include Drs. Kirby S. McBee, Owenton, Clement V. Hiestand, Campbellsville, and Walter I. Hume, Louisville, vice presidents. Dr. Philip E. Blackerby, Louisville, state health officer, is the secretary. The next annual meeting will be held in Bowling Green.

Visiting Professors Provided Under New Fund.—The Commonwealth Fund has established a fund to bring visiting professors to the University of Louisville School of Medicine. Dr. Carl V. Moore, associate professor of medicine, Washington University School of Medicine, St. Louis, was to start his residence October 9 to continue through October 21, and Dr. William F. Windle, professor of neurology and director of the institute of neurology, Northwestern University Medical School, Chicago, will be in residence for the month of November. Changes in the faculty at Louisville include the resignation, effective November 15, of Dr. Gerhard Lehmann, associate professor of pharmacology, to become pharmacologist of Hoffmann-La Roche, Inc., Nutley, N. J. Dr. Richard C. Porter, instructor in medicine, University of Buffalo School of Medicine, and associate director of laboratories in the Edward J. Meyer Memorial Hospital, Buffalo, has been made assistant professor of pharmacology at Louisville. He has a medical service in the Louisville General Hospital and will teach applied pharmacology to the medical students.

LOUISIANA

New Tuberculosis Society.—A charter has been adopted and the organization completed of the Tuberculosis Association of New Orleans with Drs. John H. Musser as president and Julius L. Wilson as medical consultant. The group formerly functioned as the Tuberculosis Committee of New Orleans.

Personal.—Dr. Marie-Louise M. Pareti has resigned as acting chief of the section of maternal and child health of the Louisiana State Board of Health to become assistant to Dr. James R. Reinberger, Memphis, Tenn. Dr. Elvira A. Corrales-Smith, Monroe, has been appointed director of the Acadia Parish Health Unit.

MICHIGAN

Bruce Testimonial Lecture.—Dr. John W. Hirshfeld, Detroit, will deliver the opening lecture in each of the nine centers sponsored by the committee on postgraduate medical education of the Michigan State Medical Society this fall. His subject will be "Penicillin" and the lecture has been designated the James D. Bruce testimonial lecture in honor of Dr. Bruce, who has been chairman of the committee on postgraduate medical education for a long period.

Beaumont Gavel Given to State Society.—At special ceremonies recently the Mackinac Island State Park Commission, Mackinac Island, presented the Beaumont gavel to the Council of the Michigan State Medical Society. The gavel was carved out of the only piece of timber which has ever been allowed to be taken from the Early House on Mackinac Island, where Dr. William Beaumont cared for Alexis St. Martin. The wood is pure white pine and was grown and cut on the island and used in the original structure of the Early House. The presentation was made by Wilfred F. Doyle, chairman and resident commissioner of the Mackinac Island State Park Commission, who reported that the Early House had been purchased through a grant made by Parke, Davis & Company and outlined the plans to put the building into shape as a museum and memorial to Dr. Beaumont. Mr. Doyle recom-

recommended the appointment of a permanent committee representing the Michigan State Medical Society, the Beaumont Foundation and the Mackinac Island State Park Commission to ensure maintenance of the Beaumont shrine.

Nutrition and Public Health.—"Implications of Nutrition and Public Health in the Postwar Period" will be the theme of a conference November 3 in the auditorium of the Horace Rackham Memorial Building, Detroit, under the auspices of the Children's Fund of Michigan. The following will participate:

- Dr. Frank G. Boudreau, New York, The International Implications of Freedom from Want of Food.
- Dr. Paul R. Cannon, Chicago, The Importance of Proteins in Resistance to Infection.
- Dr. L. Emmett Holt Jr., Baltimore, Protein Deficiencies in Man.
- Dr. Philip C. Jeans, Iowa City, Maintaining Dental Health.
- Charles G. King, Ph.D., New York, Vitamins and the Health of the Nation.
- Leonard A. Maynard, Ph.D., New York, Food Production for Better Health and Longer Life.
- Elmer V. McCollum, Sc.D., Baltimore, Our National Diet and Future Health.
- Roy C. Newton, Ph.D., Chicago, Role of Food Technology in Improving Nutrition.
- Dr. Harold C. Stuart, Boston, Nutritional Reconditioning of Children in Occupied Countries.
- Group Captain Frederick F. Tisdall, R. C. A. F., Research and Nutrition for Human Health.

MINNESOTA

Proposed Medical Foundation.—The merger of two funds within the Hennepin County Medical Society has been proposed to found the Hennepin County Medical Foundation. This plan, which would combine an existing trust fund in the society and the recently approved annuity-insurance setup, would finance medical research and laboratory projects, lectures, medical scholarships, awards for medical achievements, a medical library, the promotion of health education and loans, without interest, to physicians who have served in the armed forces and who will be in need of assistance in reestablishing themselves. It is believed that the contributions to the existing trust fund or to the proposed new fund would increase if contributions could be considered tax exempt, and a ruling on the subject is now under consideration.

NEW JERSEY

Dr. Shangle Honored.—A dinner was held in Elizabeth recently in honor of Dr. Milton A. Shangle in recognition of his promotion to the position of senior attending surgeon at the Elizabeth General Hospital and Dispensary, where he has served successively as intern, dispensary physician, assistant surgeon, gynecologist, obstetrician and surgeon. A portrait of Dr. Shangle, executed by Maxwell Stewart Simpson, Elizabeth, was presented to the physician by members of the staff. Dr. Shangle graduated at the Columbia University College of Physicians and Surgeons in 1900 and came to Elizabeth the following year.

Industrial Health Study.—Dr. Marie A. Sena, Newark, has been engaged by the bureau of industrial health of the New Jersey Department of Health to conduct a study of industrial health of workers in the food processing and related agricultural industries. Information on the medical facilities and plant health programs of canneries and of fertilizer, flour, feed and other industries will be obtained. The health and sanitary facilities of workers will be observed, according to *Industrial Medicine*. The bureau is beginning the publication of an Industrial Health Bulletin, the first issue of which will be devoted to the prevention of heat illness.

NEW YORK

New Executive Secretary of Westchester County.—Mr. Boyden Roseberry, director of the medical department of the Children's Aid Society of New York, is the new executive secretary of the Medical Society of the County of Westchester.

Ninety Years of Age.—Dr. Myron E. Carner, who has been active in Lyons fifty-six years, celebrated his ninetieth birthday, September 17. The physician graduated at the University of Vermont College of Medicine, Burlington, in 1885.

Graduate Lectures.—Morton C. Kahn, Ph.D., associate professor of public health and preventive medicine, Cornell University Medical College, New York, will address the Memorial Hospital of Greene County and the Greene County Medical Society, October 26, Catskill, on "Transmission of Disease by Lice, Fleas, Ticks and Other Insects." On November 17 Dr. Leo E. Gibson, professor of clinical surgery (urology), Syracuse University College of Medicine, Syracuse, will

discuss "Infections of the Genitourinary Tract" before the Cortland County Medical Society. Dr. Albert G. Swift, professor emeritus of surgery, Syracuse University College of Medicine, addressed the society, October 20, on "Surgical Lesions of the Biliary Tract."

New York City

Medical Alumni Honors Doorman.—Charles Costello, 75 year old doorman at Columbia University College of Physicians and Surgeons, was the guest of honor at a dinner, September 26, given by the medical school alumni association in recognition of his completion of fifty years of service to the university. Guest speakers at the dinner, which was the annual fall meeting and dinner of the alumni association, included Comdr. Gordon M. Bruce (MC), John F. Kieran and Dr. Willard C. Rappleye, dean of the college. Dr. John J. H. Keating, president of the alumni association, presided.

First Achievement Award Goes to Robert Dickinson.—On September 28 Dr. Robert L. Dickinson, in charge of a studio of medical art at the New York Academy of Medicine, received the first Alumni Achievement Award at the commencement exercises of Long Island College of Medicine, Brooklyn. Dr. Dickinson graduated at the college in the class of 1882. The medallion which constitutes the award bears the head of Hygeia, goddess of health. It has been established to honor graduates of the college who have made notable contributions to American medicine. Eleven prize awards went to ten students in the graduating class who trained for the army medical corps and one who trained for the navy medical corps. Top honors in the class went to Lieut. Hector Wright Benoit Jr., M. C., who received the Mitchell prize, awarded to the member of the class who in the judgment of the faculty is best qualified in all departments of medicine, and Lieut. Leonard Lincoln Madison, M. C., who received the Phi Delta Epsilon prize, awarded for the highest scholastic record. Lieutenant Benoit, who graduated at Cornell University, is serving his internship at Kings County Hospital and Lieutenant Madison, who graduated at Ohio State University, is serving his internship at Mount Sinai Hospital. Nine other prizes include:

- Lieut. Raymond Saigh, M.C., the Dudley Medal for the best clinical report of a case in the medical wards of the college.
- Lieut. Grafton Edgar Burke, M. C., the Dudley Memorial Medal for the best clinical report of a case in the surgical wards of the college.
- Lieut. John Andrew Matheson, M. C., the Ford Prize for the best dissertation.
- Lieut. Charles Mindell Plotz, M. C., the Nathan H. and Johanna Szerlip Medal for the best thesis on pneumonia.
- Lieut. Leonard Castleman, M. C., the Alumni Prize to the member best qualified in gynecology.
- Lieut. Joseph Daniel Casolaro, M. C., Prize of the Class of 1898 to the member whose scholastic average in the fourth year has shown the greatest improvement over that of previous years.
- Lieut. Joseph John Lambert Jr. (MC), the Obstetric Prize for the best thesis on a subject in obstetrics.
- Lieut. Bernard Anatole Sachs, M. C., the Robert R. Benedict Jr. Prize for the best report on a psychosomatic study.
- Lieut. Herbert Jay Rosen, M. C., the Joseph Howard Raymond Prize in physiology.

NORTH CAROLINA

Officers of Examining Board.—Dr. Charles W. Armstrong, Salisbury, was chosen president of the North Carolina State Board of Medical Examiners at the board's semiannual meeting in Raleigh in September, succeeding Dr. Lester A. Crowell Jr., Lincolnton. Dr. Ivan M. Proctor, Raleigh, is the new secretary of the board, succeeding Dr. William D. James, Hamlet.

Dr. Roger Baker Goes to Alabama.—Dr. Roger D. Baker, associate professor of pathology in charge of surgical pathology, Duke University School of Medicine, Durham, has been appointed professor and chairman of the department of pathology in the Medical College of Alabama at Birmingham, effective on December 1. Dr. Baker requests that necropsy and surgical materials for the Fungus Disease Registry be sent to him at Birmingham 5 after that date. The mycologic and serologic materials of this registry should continue to be sent to the office of Dr. David T. Smith, Duke Hospital, Durham.

Personal.—Dr. Yates S. Palmer, Valdese, has been appointed a member of the North Carolina Hospitals Board of Control.—Dr. Harold C. Whims, Newton, health officer of Catawba County, has also been given the administrative direction of the unit in Iredell County.—James C. Andrews, Ph.D., professor of biologic chemistry and head of the department at the University of North Carolina School of Medicine, Chapel Hill, is serving as exchange professor of biologic chem-

istry and nutrition at the National University of Guatemala Medical School, Guatemala City, for a period from September 1 to January 1. Granvil C. Kyker, Ph.D., is acting head of the department at the university.

OREGON

State Medical Election.—Dr. Lansford M. Spalding, Astoria, was chosen president-elect of the Oregon State Medical Society at its meeting in Portland, September 3, and Dr. Edward H. McLean, Oregon City, was installed as president. Other officers include Drs. James C. Hayes, Medford, Dean P. Crowell, Marshfield, and Burton A. Myers, Salem, vice presidents. Dr. Thomas S. Saunders Jr., Portland, was named secretary and Dr. Richard Lloyd Tegart, Portland, treasurer. Portland was tentatively chosen as the place for the 1945 session sometime in September.

PENNSYLVANIA

State Medical Election.—Dr. William L. Estes Jr., Bethlehem, was named president-elect of the Medical Society of the State of Pennsylvania at its annual meeting, September 20, and Dr. William Bates, Philadelphia, was inducted into the presidency. Dr. Walter F. Donaldson, Pittsburgh, is secretary. The next annual session will be held in Philadelphia about October 1.

Philadelphia

Lectures on Mental Hygiene.—The committee on nervous diseases and mental hygiene of the Philadelphia County Medical Society opened a series of lectures on mental hygiene September 25 with a talk by Dr. Frederick H. Allen on "Mental Health from the Standpoint of Child Guidance" and one by Dr. Ralph M. Tyson on "The Relation of Mental Health to the Growth and Development of the Child." Others in the series include:

- Drs. Edward Weiss, Mental Health as Related to Internal Medicine, and O. Spurgeon English, Psychosomatic Medicine, October 2.
- Drs. Winntred B. Stewart, Delinquency in Minors as Seen at the Municipal Court, and Gerald H. J. Pearson, Disturbances of Mental Health as Recognized in the Delinquency of Minors, October 9.
- Drs. Edward A. Steinhilber, Recognition of Disturbances of Mental Health, and Joseph C. Yaskin, Aids to the General Practitioner in the Handling of Psychoneurosis, October 16.
- Dr. Bernard J. Alpers, Disturbed Mental Health from Head Injuries and as an Organism, and Lieut. Comdr. Joseph F. Hughes (MC), The Study of Psychoses, October 23.
- Drs. Leroy M. ... of Psychoneurotic Service Men and Their Psychologic Adjustment to Civilian Life, and Robert A. Matthews, Marital Situations in Which Mental Health Plays a Part, October 30.
- Drs. H. Craig Bell, Responsibility of the Medical Man in the Role of an Activator of Mental Disturbance, and Samuel B. Hadden, Treatment of Psychoses, November 6.

Care of Mentally Defective Children.—A committee appointed by Charles L. Brown, president judge of the Municipal Court of Philadelphia, to study the problem of the care and disposition of the feeble-minded, epileptic and the defective delinquent, has submitted a report. The committee has divided its recommendations into two groups, those concerned with institutional placement and those with extrinstitutional family placement. Concerning the former, it is urged that immediate provision should be made for an increase of at least 50 per cent in the bed capacity to be used largely for defective children of low earning and indigent families. For a long term program the bed capacity must be increased by at least 100 per cent. Specific recommendations pertain to certain institutions, one suggestion urging the establishment of a new institution for the feeble-minded outside of Philadelphia to serve the city and the surrounding counties, thereby with other additions helping to eliminate the disparity (estimated as 2 to 1) between the bed capacity for defectives in the western part of the state as compared with the eastern part of the state. The report emphasizes the immediate need for special provisions to care for the group requiring custodial care (about 800 low grade defectives for Philadelphia). Special accommodations should be made for cases with accompanying physical handicaps. It is pointed out that an institution for defective delinquent boys, both white and Negro, under the age of 15 years is urgently needed. This should be an institution of the cottage system type with provisions for manual training through trade and farm schooling. It should be state controlled and, with a capacity of about 200, should serve Philadelphia and adjacent counties. Added accommodations are needed for a similar group to meet the needs of boys 16 and 17 years of age who are now committed to the Huntingdon Reformatory. There is also a need for an institution for female defective delinquents, irrespective of age and color, and

one for the more seriously delinquent girls below 16 years of age. In its consideration of family placement facilities and extrinstitutional (community) care, the organization of a central agency, board of review, is urged for Philadelphia to register all mental defectives, epileptic persons and defective delinquent cases, to review all problem cases and to maintain follow-up records. This board should be established under the Philadelphia Department of Public Welfare and have available all data concerning changes in status and location of individual children. The expansion of the release and parole policy of institutions is treated in the report and the urgent need for special consideration in the family care in foster homes. Individual recommendations are made covering the systematic training, investigation and selection of the foster family.

TENNESSEE

Changes in Health Officers.—Dr. Joseph T. Nardo, Somerville, has resigned as director of the Fayette County Department of Health to reenter the U. S. Public Health Service.—Dr. Rutherford O. Ingham, Johnson City, has resigned as director of the Washington County Health Department. He will be succeeded by Dr. Marion G. Fisher, Jonesboro.—Dr. Robert B. Griffin has been named director of the Jackson and Madison County Health Department to succeed Dr. Lamar A. Byers, who accepted a similar position in Coos County, Oregon.—Dr. Fray O. Pearson, director of the Chattanooga-Hamilton County Health Department, has resigned to enter private practice and become associated with the Earl Campbell Clinic, effective October 1. Dr. Paul M. Golley, director of the division of tuberculosis control, has been named director of the health unit. Dr. Pearson became head of the Hamilton County unit in 1939 and remained in the position when the city and county health departments were merged in 1941.

UTAH

Personal.—Dr. Ezra C. Rich, Ogden, was given a dinner by the Weber County Medical Society, August 23, in recognition of his completion of fifty years in the practice of medicine and of his eightieth birthday.

University News.—Dr. James P. Kerby has resigned as associate clinical professor of medicine (radiology) at the University of Utah School of Medicine, Salt Lake City. He had been serving on a part time basis. On September 10 the first graduation exercises of the new four year medical school were held. Thirty-two men and three women were granted the degree of doctor of medicine. Honorary degrees of doctor of science were conferred on Thomas Parran, Surgeon General of the U. S. Public Health Service, who gave the commencement address, and Dr. Samuel C. Baldwin, one of the pioneer orthopedic surgeons in Utah.

WISCONSIN

State Medical Election.—Dr. Patrick R. Minahan, Green Bay, was named president-elect of the State Medical Society of Wisconsin at its annual meeting in Milwaukee, September 19. Dr. Charles Fidler, Milwaukee, was installed as president. Mr. Charles H. Crownhart, Madison, is the secretary.

Meeting of Chest Physicians.—On September 17 the first annual meeting of the Wisconsin Chapter of the American College of Chest Physicians was held at the Hotel Schroeder, Milwaukee. The speakers included:

- Dr. Frederick M. F. Meixner, Peoria, Ill., Pregnancy in Tuberculosis.
- Dr. Minas Joannides, Chicago, Tuberculosis Control in General Hospitals.
- Drs. Abraham R. Hollender and Paul B. Szanto, Chicago, Tuberculosis of the Nasopharynx.
- Dr. Richard M. Davison, Chicago, Surgical Management of Empyema.
- Dr. Jay Arthur Myers, Minneapolis, The Medical Profession and the Control of Tuberculosis.

Dr. Leon H. Hirsh, West Allis, is secretary-treasurer of the Wisconsin chapter.

University Society Meetings.—The University of Wisconsin Medical Society, Madison, opened its regular meetings October 3 with a presentation by Merle S. Nichols, Ph.D., and Paul H. Phillips, Ph.D., on "Fluorine and Dental Caries." Subsequent lectures in the series will include:

- Dr. Charles J. Thill, Present Status of Penicillin Therapy, November 7.
- Staff of McArdle Memorial Laboratory, Current Research Problems in Cancer, December 5.
- Malcolm R. Irwin, Ph.D., Genetics and Resistance to Disease, January 2.
- John A. E. Eyster, Ph.D., Recent Advance in Cardiac Physiology, February 6.
- Harland W. Mossman, Ph.D., and Roland K. Meyer, Ph.D., Some Special Structures and Functions of the Ovary, March 6.
- Dr. Philip P. Cohen, Some Aspects of Protein Metabolism in Disease, April 3.
- Dr. Raymond C. Herrin, Recent Advance in Kidney Physiology, May 1.

GENERAL

National Committee on Alcohol Organized.—The organization of a National Committee for Education on Alcoholism, Inc., was announced October 2. Offices will be at 2 East 103d Street, New York. Elvin M. Jellinek, Sc.D., director of the Yale School of Alcohol Studies, New Haven, Conn. (*THE JOURNAL*, June 12, 1943, p. 454), is chairman of the board of the new committee and Mrs. Marty Mann is executive director.

Achievement Award Goes to Florence Seibert.—The National Achievement Award medal, sponsored by Chi Omega Sorority annually to honor "an American woman of notable accomplishments," was presented to Florence B. Seibert, Ph.D., associate professor of biochemistry at the Henry Phipps Institute in Philadelphia, October 6, by Mrs. Roosevelt. The honor goes to Dr. Seibert for her work in tuberculosis research.

Dr. Goodpasture Receives Sedgwick Medal.—The Sedgwick Memorial Medal of the American Public Health Association was presented to Dr. Ernest W. Goodpasture, professor of pathology, Vanderbilt University School of Medicine, Nashville, October 3. The medal is given for distinguished service in public health. Dr. Goodpasture, among other achievements, is recognized for his work on originating a method to cultivate micro-organisms of typhus fever.

Sage Foundation Creates Department of Studies in the Profession.—Esther Lucile Brown has been appointed director of the newly organized department of studies in the professions of the Russell Sage Foundation, New York. Miss Brown has been a member of the foundation's staff since 1933 and is the author of five volumes dealing respectively with the professions of engineering, law, medicine, nursing and social work. According to an announcement, the department will continue to make studies or carry on research in the social aspects of the professions, having completed five studies before its formal organization.

Special Society Elections.—Major Barnes Woodhall, M. C., was elected president of the American Academy of Neurological Surgery at its recent meeting in White Sulphur Springs, W. Va., Dr. Arthur R. Elvidge, Montreal, vice president and Dr. Theodore C. Erickson, Madison, Wis., secretary-treasurer. —Capt. John C. Adams (MC) was chosen president-elect of the Aero Medical Association of the United States at its annual meeting in St. Louis, September 4, and Brig. Gen. Eugen I. G. Reinartz, M. C., was installed as president. Other officers include Dr. Delazon S. Bostwick, Ardmore, Pa.; Major Gen. David N. W. Grant, M. C.; Dr. William R. Stovall, Washington, D. C.; Air Commodore James W. Tice, R. C. A. F., and Col. Arnold D. Tuttle, M. C., retired, vice presidents; Dr. James C. Braswell, Tulsa, Okla., business manager and Dr. David S. Brachman, Detroit, secretary-treasurer.

Neuropsychiatric Meeting.—The Central Neuropsychiatric Association will hold its annual meeting at the Palmer House, Chicago, October 31. Among the speakers will be:

Dr. Loren W. Avery, Chicago, The Neurologic Symptoms Associated with Porphyria.

Dr. Abram E. Bennett, Omaha, Meningioma of the Foramen Magnum.

Dr. John L. Garvey, Milwaukee, Cases of Serum Neuritis.

Dr. Ladislav J. Meduna, Chicago, The Common Factors in Shock Therapy.

Dr. Howard D. McIntyre, Cincinnati, The Prognosis and Treatment of Multiple Sclerosis.

Dr. Joseph C. Michael and Charlotte Buhler, Minneapolis, Comparative Diagnostic Studies with the Use of Rorschach, Murray Apperception and Minnesota Multiphasic Tests.

Dr. Richard B. Richter, Chicago, Degeneration of the Basal Ganglia from Chronic Carbon Disulfide Poisoning in Monkeys.

Dr. Andrew L. Skoog, Kansas City, Mo., Nervous Complications of Sickle Cell Anemia.

Dr. Harold C. Voris, Chicago, Massive Extrusion of Lumbar Intervertebral Disks.

Other sessions will be held at the University of Chicago, Northwestern University, University of Illinois and Loyola University medical schools.

Maternal Mortality.—In 1942 there were twenty-nine states in which the maternal death rate was less than 2.5 per thousand live births, a record indicating the continued reduction in maternal mortality, according to statisticians of the Metropolitan Life Insurance Company. Two years earlier only two states recorded such a low figure. Of all the states South Carolina alone in 1942 had a maternal death rate of more than 5 per thousand live births, while the number of states totaled thirty-one in 1936. The change is attributed chiefly to the widespread use of sulfonamide drugs in cases

of puerperal septicemia. In 1942 the leading causes of maternal deaths were septicemia, which accounted for more than 2,800 deaths, puerperal toxemia, which was responsible for 1,900 deaths, and puerperal hemorrhage, which caused about 1,100 deaths. One out of every 6 maternal deaths in the United States is due to abortion. This figure is an understatement, it was stated, "because many of the fatalities from illegal abortion are not reported as such and therefore are classified under other causes."

Committee for Mental Hygiene.—The thirty-fifth annual meeting of the National Committee for Mental Hygiene will be held at the Hotel Pennsylvania, New York, November 8-9. The program has been divided into four sections: mental hygiene of industry and reconversion, rehabilitation and the returning veteran, race relations and services to the mentally ill today. Included among the speakers will be:

Col. H. Edmund Bullis, The Hazards of Industrial Change-Over.

Dr. Bruno Solby, Washington, D. C., The Meaning of Mental Hygiene in Industry.

Dr. Matthew Brody, Brooklyn, Dynamics of Mental Hygiene in Industry.

Dr. Samuel W. Hamilton, Washington, Needs and Opportunities in the Mental Hospital Field.

Capt. Wilson R. G. Bender, The Man as He Leaves the Service.

Dr. Solomon W. Ginsburg, New York, Community Responsibility for Neuropsychiatric Discharges.

Mrs. Ethel Ginsburg, New York, Veteran Into Civilian—The Process of Readjustment.

Dr. Thomas A. C. Rennie and Luther E. Woodward, Ph.D., New York, Rehabilitation of the Psychiatric Casualty.

H. Scudder Mekeel, Ph.D., Madison, Wis., Cultural Aids to Constructive Race Relations.

Robert L. Cooper, Esopus, N. Y., Frustrations of Being a Member of a Minority Group: What Does It Do to the Individual and to His Relationship with Other People?

Harry C. Oppenheimer, New York, subject not announced.

Leonard Edelstein, Philadelphia, Dangers to Our Care of Patients.

Dr. Frank F. Tallman, Columbus, Ohio, What the Mental Hygiene Program of a State Might Be.

Features of a luncheon session will be the presentation of the Lasker Award in Mental Hygiene and an address by Lyman Bryson of the Columbia Broadcasting System, New York, on "Effect of Peace Conditions on International Amity."

Government Services

Medical Director of Public Health District Appointed

Dr. Otis L. Anderson, Washington, has been appointed medical director of district number 4 of the U. S. Public Health Service, with headquarters at New Orleans, to succeed Dr. Charles L. Williams, who recently went to Washington to become director of the Bureau of States Services (*THE JOURNAL*, September 9, p. 117).

Rotating Internships and Residencies

Applications are now being accepted to fill positions as rotating interns and psychiatric residents at St. Elizabeths Hospital, the federal institution for the treatment of mental disorders in Washington, D. C. The positions pay \$2,433 a year, including overtime pay. The internship consists of nine months of rotating service including medicine, surgery, pediatrics (affiliation), obstetrics (affiliation) and, as conditions permit, psychiatry and laboratory. Applicants must be third or fourth year students in an approved medical school. Psychiatric resident positions consist of nine months in psychiatry. Applicants must have successfully completed their fourth year of study in a medical school and they must have the degree of B.M. or M.D. In addition they must have completed an accredited rotating internship of at least nine months or be serving such internship at the time of making application. Persons who attain eligibility but who are still serving their internship may have their names submitted for appointment, but they cannot enter on duty until they have completed their internship. There are no age limits for this examination, and no written test will be given. Applications will be accepted until the needs of the service have been met. Application forms may be secured at first and second class post offices, from the commission's regional offices, or direct from the U. S. Civil Service Commission, Washington 25, D. C. Appointments to federal positions are made in accordance with War Manpower Commission policies and employment stabilization programs.

Foreign Letters**LONDON***(From Our Regular Correspondent)*

Sept. 23, 1944.

Patulin for the Common Cold

In November 1943 a report was published on a clinical trial of patulin, a metabolic product of the mold *Penicillium patulum*, claiming that it had given significant results in the treatment of the common cold. The results in 95 cases were considered encouraging when compared with 85 controls. The discovery of an effective treatment for the common cold being thought desirable, the Medical Research Council decided to investigate. Definition of the common cold offered considerable difficulties. There is no reason to believe that the condition is always or even usually due to the same agent. A second difficulty is that the duration of colds is variable. Third, the objective signs are too variable to serve as criteria for the presence and progress of colds. To meet the first difficulty large numbers of patients at widely separated places were used. To meet the second difficulty alternate cases were given a spurious treatment and served as controls. Therapeutic trials were carried out in eleven factories with a total population of 90,000, and in three units of the post office with a population of 15,000. The test solution was instilled into the nostrils. In all, 668 patients were treated with patulin and 680 with a control solution. No evidence was found that patulin is effective in the treatment of the common cold.

The Casualties and Damage of the Second Battle of London

London has withstood two severe bombings from the air which were entirely indiscriminate. The first and more severe was in 1940 and was made by bombing planes. The second began on June 15 of the present year and was made with flying bombs. The first ten weeks were the period of greatest intensity. The number of persons evacuated from London amounted to 818,000. At the end of June 81,000 were sheltering in the stations of the underground tube railway, but this was an improvement compared to 123,000 in September 1940. In public shelters of all kinds there were 462,000, compared to 470,000 in November 1940. The intensity of the attack at the end of June was shown by the fact that nearly half of the 400,000 houses damaged in the first two weeks had not received even a "field dressing." Early in July London began to get into its stride, and the evacuation machinery was running smoothly. Apart from those who went at their own expense there went out under government plans no fewer than 818,000 persons: 228,000 mothers and expectant mothers, 537,000 children and 53,000 old, invalid and blind. One hundred London hospitals were damaged. The growing loss of beds and the possibility of an increasing attack led to evacuation of over 14,000 patients to hospitals all over Britain. The number of flying bomb casualties admitted to London hospitals was 14,558. The work in the hospitals from the start was magnificent. The ambulance service carried 27,000 casualties, and the first aid posts with their mobile units attended to 40,000 minor cases. The special ambulance service for transferring patients from damaged hospitals to others and for the reception of overseas casualties carried 52,000 patients in the first ten weeks.

Each flying bomb destroyed or damaged an average of four hundred houses during the ten weeks. Some 51,000 people were rehoused in requisitioned houses and 57,000 were billeted. A labor force of 75,000 was engaged in repairs of houses and other buildings. Everything possible was done to see that as many homes as possible were created in the coming months. At the present time there are nearly 900,000 houses in London in need of repair from bomb damage.

National Scheme for the Diagnosis of Pulmonary Tuberculosis by Mass Radiography

The Medical Research Council's Committee on Tuberculosis in Wartime recommended that mass radiography should be under the general direction of the Ministry of Health and should not be lightly undertaken. A high standard of quality was necessary for correct interpretation, which required great radiologic skill. The Mass Radiography Subcommittee of the Minister of Health's Standing Advisory Committee on Tuberculosis laid down that, when mass miniature radiography is undertaken on a large scale, trustworthy and comparable results can be secured only from the use of carefully designed standard apparatus. The government therefore ensured that the standard apparatus which is arranged to be manufactured and supplied to selected local authorities should be of the highest quality and able to meet much greater stresses than ordinary x-ray machines.

As employers may be considering arrangements for the mass radiography of their employees, the Ministry of Health has issued a warning and pointed out that there are difficulties and dangers which may not be obvious. The primary purpose of mass radiography is not diagnosis in the ordinary sense. The object is to discover in a group of ostensibly healthy persons those who have signs indicating the possibility of incipient disease, which should be further investigated by more intensive methods. Persons who do not have ground to suspect that they are in any risk of illness must be ready to be examined. Anything that would weaken public confidence in mass radiography would therefore impair its usefulness. So also would anything that would lead the public to expect too much from this new method.

It is important to realize that mass radiography has not made the diagnosis of pulmonary tuberculosis easier; on the contrary, it brings to light many symptomless minimal cases. Recovery occurs spontaneously in numbers of these without treatment, and the prognosis in any case can be assessed only by the most careful clinical investigation and periodic supervision. As the diagnosis of tuberculosis may involve change or loss of work and may prejudice life insurance, it should be made only by experts with all the diagnostic procedures at their disposal. Provision for this is made in the national scheme operated by the health authorities. Another point is that the government's mass radiography scheme includes arrangements for collecting far more information on the incidence of tuberculosis than has ever been available before, which will be of great value in the campaign against tuberculosis. This can be assured only by a uniform scheme and a standardized system of records.

Marriages

HARRY BELLACH, Brooklyn, to Dr. ELIZABETH CORNFIELD of New Haven, Conn., in Brooklyn, September 10.

WILLIAM ANDREW DALE, Columbia, S. C., to Miss Corinne Craig Howell of Nashville, Tenn., September 11.

GEORGE SHERMAN RIPLEY JR., Mount Vernon, N. Y., to Miss Phyllis E. Walch of Torrington, Conn., June 28.

WILLIAM LYMAN HUFFMAN, Cleveland, to Miss Jane Elizabeth Molin of Lakewood, Ohio, in September.

ROBERT JAMES BARNETT, Greenwood, Miss., to Miss Martha Ann Robinson in New Orleans, August 26.

WILLIAM C. CLYNE to Miss Kathryn Fitzgerald, both of New York, in Katonah, N. Y., September 11.

RAYMOND F. GRENFELL, Pittsburgh, to Miss Maude Byrnes Chisholm of Columbia, S. C., August 19.

ALVIN J. BEECHER to Miss Violet Aurelia Dionca, both of Detroit, August 12.

M. BAXTER ASNIS, New York, to Miss Elfreda M. LEONARD of Boston in May.

Deaths

Lieuten Moss Rogers • Senior Surgeon, U. S. Public Health Service, Fort Worth, Texas; University of Texas School of Medicine, Galveston, 1916; specialist certified by the American Board of Psychiatry and Neurology, Inc.; member of the American Psychiatric Association; served as vice president of the Kentucky Psychiatric Association; entered the U. S. Public Health Service Reserve as an assistant surgeon in October 1921 and became a member of the regular corps April 5, 1922, serving at the Quarantine Station, New Orleans; accepted a commission as a first lieutenant in the U. S. Army in 1917 and served in that capacity at Kelly Field, San Antonio, Texas; went overseas in July 1918 and became battalion medical officer of a front line unit; from 1922 to the time of his death he served as public health officer in New Orleans, Washington, D. C., New Mexico, Colorado, Missouri, New York, Texas and at the American Consulate, Cobh, Irish Free State; had been associated with Dr. Joseph Goldberger in the isolation of the pellagra preventive vitamin and the determination of the pellagra preventive values of various foods; from 1936 to 1940 had been medical officer in charge of field studies in mental hygiene at Lexington, Ky.; in 1940 detailed to Springfield, Mo., Medical Center for Federal Prisoners; transferred to the Federal Reformatory at Chillicothe, Ohio, in 1941 and at about the same time was promoted to senior surgeon; remained at the institution in Chillicothe until his most recent transfer, July 1, 1944, to the U. S. Public Health Service Hospital in Fort Worth, where he died September 7, aged 53, of coronary thrombosis.

John Sinclair Dye • Waterbury, Conn.; Vanderbilt University School of Medicine, Nashville, Tenn., 1900; Columbia University College of Physicians and Surgeons, New York, 1915; fellow of the American College of Surgeons; past president of the New Haven County Medical Association and the Waterbury Medical Association; first lieutenant, Tennessee National Guard, Company B, Detached Cavalry, from 1901 to 1908; entered the medical corps of the U. S. Army during World War I as a captain and advanced to the rank of colonel after two years; after the war worked for a time in the Surgeon General's Office, standardizing the surgical services of army base hospitals in this country; later served as chief of the division of surgery in the Surgeon General's Office; colonel, medical reserve corps, not on active duty; at one time member of the board of health in Chattanooga, Tenn., where he was chief of staff of the Erlanger Hospital from 1908 to 1914; chief surgeon at the Chase Brass and Copper Company; on the staffs of St. Mary's Hospital and the Waterbury Hospital, where he died August 9, aged 67, of coronary occlusion with pulmonary embolism and infarction.

Walter Hughson • Chestnut Hill, Pa.; Johns Hopkins University School of Medicine, Baltimore, 1918; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology, American Laryngological, Rhinological and Otolological Society, American Otolological Society, Inc., and the American Association of Anatomists; formerly assistant and instructor in anatomy, associate in applied anatomy and surgery, associate professor of surgery and associate surgeon, associate in clinical surgery, associate in research otology and associate professor of otology at the Johns Hopkins University School of Medicine, Baltimore; served as assistant visiting surgeon to the Johns Hopkins Hospital, Baltimore; instructor in otolaryngology at the University of Pennsylvania School of Medicine and associate in otology at the University of Pennsylvania Graduate School of Medicine, Philadelphia; consultant to the Bureau of Child Hygiene, U. S. Public Health Service; since 1935 director of the otologic research laboratory at the Abington Memorial Hospital, Abington, where he died September 13, aged 53, of pneumococcal meningitis.

Robert Bennett Bean, Charlottesville, Va.; Johns Hopkins University School of Medicine, Baltimore, 1904; retired in 1942 as professor of anatomy at the University of Virginia Department of Medicine, where he had been since 1916; assistant in anatomy at his alma mater, 1904-1905; instructor of anatomy at the University of Michigan, Ann Arbor, from 1905 to 1907; formerly director of the anatomic laboratory and associate professor of anatomy at the Philippine Medical School, Manila; at one time associate professor of anatomy and professor of Gross anatomy at the Tulane University School of Medicine, New Orleans; served as president of the New Orleans Academy of Sciences; fellow of the American

Association for the Advancement of Science; member of the American Association of Anatomists and the American Anthropological Association; corresponding member of the Societa Romana Antropologia; author of "Racial Anatomy of the Philippine Islanders," 1910, "Races of Man," 1932, and "Peopling of Virginia"; died in Staunton August 27, aged 70, of cerebral arteriosclerosis and cerebral hemorrhage.

John Borneman Ludy • Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1906; specialist certified by the American Board of Dermatology and Syphilology; member of the American Academy of Dermatology and Syphilology; demonstrator of dermatology at the Jefferson Medical College; served during World War I; colonel, medical reserve corps, U. S. Army, not on active duty; author of "Atlas of Skin Disease"; received an honorary degree of doctor of science from the Franklin and Marshall College, Lancaster, Pa.; consulting dermatologist to the Delaware County Hospital, Drexel Hill, and Norristown State Hospital, Norristown; dermatologist, American Oncologic Hospital, Hospital of the Protestant Episcopal Church, Lankenau Hospital, Methodist Hospital, Philadelphia General Hospital, Pennsylvania Hospital and the Abington Memorial Hospital, Abington, Pa., where he died September 11, aged 64, of cardiovascular disease.

Hermann Bertram Gessner • New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1895; since 1936 professor of clinical surgery, emeritus, at his alma mater, where he had been lecturer and demonstrator of operative surgery, professor of operative surgery and clinical surgery and professor of clinical surgery; president of the Louisiana State Medical Society, 1930-1931, and the Orleans Medical Society in 1902; member of the Southern Medical Association and the Southern Surgical Association; fellow of the American College of Surgeons; acting assistant surgeon in the U. S. Public Health Service in 1897 and 1905; veteran of the Spanish-American War; first lieutenant in the medical reserve corps of the U. S. Army from 1909 to 1917; served on the Mexican Border in 1916; for many years on the staffs of the Charity Hospital and the Touro Infirmary; author of "Laboratory Exercises in Operative Surgery"; died August 31, aged 72, of coronary thrombosis.

Ned Rudolph Smith • Tulsa, Okla.; University of Michigan Medical School, Ann Arbor, 1921; member of the American Psychiatric Association and the Southern Medical Association; past president and trustee of the Tulsa County Medical Society; president of the city board of health; in 1926 joined the staff of the Hertzler Hospital and Clinic in Halstead, Kan., where he had been in charge of the neurology and psychiatry work; medical director of the Oakwood Sanitarium; served as psychiatrist at the Tulsa Induction Center for one year; member of the chamber of commerce and the Kiwanis Club; on the editorial board of the *Journal of the Oklahoma State Medical Association*; on the staffs of the Hillcrest Memorial Hospital and St. John's Hospital, where he died August 18, aged 60, of coronary thrombosis.

Max Harold Hoffman • St. Paul; University of Minnesota Medical School, Minneapolis, 1921; since 1937 clinical assistant professor of medicine at his alma mater, where he had been assistant in medicine from 1922 to 1924 and instructor from 1925 to 1936; specialist certified by the American Board of Internal Medicine; member of the Central Society for Clinical Research, Minnesota Academy of Medicine and the Minnesota Pathological Society; in 1941 president and formerly vice president and secretary-treasurer of the Minnesota Society of Internal Medicine; visiting physician to the Ancker Hospital, Charles T. Miller Hospital and St. Joseph's Hospital; died August 22, aged 48, of coronary heart disease.

John Janney Lloyd • Rochester, N. Y.; University of Virginia Department of Medicine, Charlottesville, 1903; specialist certified by the American Board of Internal Medicine; member of the American College of Chest Physicians, National Tuberculosis Association and the American Clinical and Climatological Association; for many years medical director of the Monroe County Tuberculosis Sanatorium; at one time resident physician of Catawba Sanatorium, Catawba Sanatorium, Va.; consultant in tuberculosis to the Strong Memorial Hospital and consulting physician to the Rochester General Hospital; consultant, silicosis board, state department of labor; died September 22, aged 65, of cerebral thrombosis.

Edwin Dial Watkins, Memphis, Tenn.; Columbia University College of Physicians and Surgeons, New York, 1906; served an internship at the Presbyterian Hospital, New York; specialist certified by the American Board of Ophthalmology;

fellow of the American College of Surgeons; formerly associate professor of gynecology and clinical assistant and assistant in ophthalmology at the University of Tennessee College of Medicine; served during World War I; formerly on the staffs of the Baptist Memorial Hospital and Memphis Eye, Ear, Nose and Throat Hospital; died in the Veterans Administration Facility July 31, aged 62, of cirrhosis of the liver.

Benjamin Everett Reeves, West Jefferson, N. C.; College of Physicians and Surgeons, Baltimore, 1891; coroner of Ashe County; Ashe County physician for prison, poorhouse and state prison camp; member of the board of trustees for the North Carolina schools for the deaf and blind; medical examiner for the draft board of the county during World War I and II; assistant surgeon for the Norfolk and Western Railway; president of the First National Bank; served on the county road commission, town council and school committee and in the state legislature; died August 30, aged 77, of heart disease.

Claude Vernet Davis ♂ Pennsville, Ohio; Ohio State University College of Medicine, Columbus, 1917; served an internship at the St. Luke's Hospital, Cleveland; president of the Ohio State Medical Board, serving at one time as vice president and member of the board; president of the Morgan County Medical Society; member of the Morgan County Draft Board; served at Base Hospital number 123 near Mars, France, during World War I; on the staff of the Memorial Hospital, Marietta, where he died August 16, aged 57, of cerebral hemorrhage.

Moody Warren Arnold ♂ New York; Vanderbilt University School of Medicine, Nashville, Tenn., 1912; medical superintendent of the Home for Incurables; died in the New York Post-Graduate Medical School and Hospital August 21, aged 56, following an operation for carcinoma of the duodenum and pancreas.

Jacob Axelrad, New York; Columbia University College of Physicians and Surgeons, New York, 1908; died August 10, aged 63, of coronary thrombosis.

Webster A. Becher, North Industry, Ohio; University of Wooster Medical Department, Cleveland, 1902; member of the Ohio State Medical Association; served on the staff of the Mercy Hospital in Canton; died August 1, aged 76, of coronary infarction.

William Wheeler Bolster ♂ Lewiston, Maine; Medical School of Maine, Portland, 1908; formerly assistant professor of physiology at his alma mater; at one time a member of the school board in Auburn; for many years on the staff of the Central Maine General Hospital, where he died August 11, aged 70, of cerebral hemorrhage.

Albert James Bower ♂ Greenville, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1905; fellow of the American College of Surgeons; served during World War I; on the staff of the United Memorial Hospital; died August 15, aged 63, of coronary heart disease.

Robert Boyd, Brooklyn; College of Physicians and Surgeons, New York, 1891; veteran of the Spanish-American War; died in the Cumberland Hospital August 1, aged 74, of coronary thrombosis.

Glenn Zimmerman Brant ♂ Berlin, Pa.; Temple University School of Medicine, Philadelphia, 1936; served an internship at the Harrisburg Polyclinic Hospital, Harrisburg; on the staff of the Somerset Community Hospital, Somerset; first lieutenant in the medical reserve corps of the U. S. Army from March 1, 1941 to Jan. 5, 1943; died in Bristol Bay, Alaska, May 19, aged 34, of suffocation by smoke.

James Frank Brooke ♂ Colonel, U. S. Army, retired, Greenville, N. C.; Kansas City Hahnemann Medical College, Kansas City, Mo., 1903; U. S. Army Medical School, 1921; commissioned a first lieutenant in the medical corps of the U. S. Army on Nov. 22, 1918; later promoted to captain, major, lieutenant colonel and colonel; retired Feb. 29, 1944; formerly post surgeon at Bolling Field, Anacostia, D. C.; died August 9, aged 64, of coronary occlusion.

John Bernard Brown, Paxton, Ill.; Illinois Medical College, Chicago, 1902; died September 12, aged 68, of coronary occlusion.

Charles O. Burgess, Monmouth, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Illinois State Medical Society; formerly deputy coroner for Warren County; served as a member of the pension examining board for veterans; on the staff of the Monmouth Hospital; died August 24, aged 68, of carcinoma.

Aaron Fenton Burson, Oakwood, Ohio; Eclectic Medical College, Cincinnati, 1910; member of the Ohio State Medical Association; served during World War I; was killed August 8, aged 59, in an automobile accident.

George Barnes Case, Syracuse, N. Y.; Syracuse University College of Medicine, 1909; member of the Medical Society of the State of New York; died August 11, aged 60, of probable coronary thrombosis.

Ferdinand Chenik ♂ Detroit; Detroit College of Medicine and Surgery, 1924; fellow of the American College of Chest Physicians; a founder and formerly medical superintendent of the Chenik Hospital; author of "White Plague"; died near Westlaco, Texas, August 15, aged 51.

Hiram Edward Cleveland ♂ Burlington, Wash.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1901; member of the North Pacific Surgical Association; fellow of the American College of Surgeons; past president of the Washington State Medical Association; served as chief of staff, Burlington General Hospital; local surgeon for the Great Northern Railway; member of the chamber of commerce; died August 21, aged 69, of arteriosclerotic heart disease.

James William Craddock ♂ Louisville, Ky.; Kentucky School of Medicine, Louisville, 1904; died in the Kentucky Baptist Hospital August 1, aged 65, of bronchopneumonia.

William David Culin, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1894; associate professor emeritus of gynecology at his alma mater; fellow of the American College of Surgeons; consulting gynecologist at the Women's Homeopathic Hospital; died August 24, aged 80, of coronary thrombosis.

Oscar H. Damron ♂ Silex, Mo.; Keokuk (Iowa) Medical College, 1896; died August 30, aged 74, of angina pectoris.

Edward Davenport, Hopkinsville, Ky.; University of Louisville Medical Department, 1901; member of the Kentucky State Medical Association; clinical director of the Western State Hospital; formerly superintendent of the Eastern State Hospital, Lexington; died August 22, aged 60, of coronary occlusion.

Harry Edward W. Fenton, Ancon, C. Z.; University of Louisville (Ky.) School of Medicine, 1929; served an internship at the Gorgas Hospital; diplomate of the National Board of Medical Examiners; member of the Medical Association of the Isthmian Canal Zone; first lieutenant in the medical reserve corps of the U. S. Army, not on active duty; since 1930 employed as physician by the health department of the Panama Canal Zone; died August 17, aged 37, of adrenal hemorrhage.

Howard Sinnickson Forman, Lee, Mass.; Columbia University College of Physicians and Surgeons, New York, 1896; served during World War I; formerly on the staff of the Christ Hospital, Jersey City, N. J.; member of the Rotary clubs of Lee and Jersey City; died in the House of Mercy Hospital, Pittsfield, September 19, aged 73, of cerebral hemorrhage following an operation.

Clare Edwin Fraunfelter ♂ Canton, Ohio; Rush Medical College, Chicago, 1904; past president of the Stark County Medical Society; for many years a member of the staff of the Aultman Hospital, serving as president for several terms; died September 5, aged 67, of cerebral thrombosis.

Abbott James Fuller ♂ Pemaquid, Maine; University of Vermont College of Medicine, Burlington, 1907; secretary of the Knox County Medical Society; served as an officer in the U. S. Army during World War I; member of the staffs of the Knox County General Hospital in Rockland and the Miles Memorial Hospital in Damariscotta; died August 18, aged 59, of cerebral hemorrhage.

Byron Edgar Giannini, Shepherdsville, Ky.; University of Tennessee Medical Department, Nashville, 1905; member of the Kentucky State Medical Association; died August 4, aged 62, of heart disease.

Orla Hilliard Gillett ♂ Grand Rapids, Mich.; University of Michigan Medical School, Ann Arbor, 1923; fellow of the American College of Surgeons; on the staffs of the Butterworth and Blodgett Memorial hospitals; served an internship, a residency and as chief of surgery at St. Mary's Hospital, where he died August 2, aged 51, of cerebral hemorrhage.

Gordon Parker Goodfellow ♂ East Orange, N. J.; Detroit College of Medicine and Surgery, 1929; captain, medical corps, Army of the United States, from Aug. 8, 1942 to Dec. 1, 1943; on the staff of the East Orange General Hospital,

where he died July 25, aged 40, of coronary thrombosis and vascular disease

Mark Gordon, Brooklyn, Baltimore Medical College, 1900; for many years attending physician and chief of clinic at the Beth-El Hospital, died August 17, aged 70, of coronary thrombosis

Theodosia S. Fowler Johansen, Morristown, N. J.; Eclectic Medical College of the City of New York, 1901, died in the Mühlenberg Hospital, Plainfield, July 27, aged 73, of cerebral embolism and carcinoma of the uterus

John Allen Johnston @ Fort Lauderdale, Fla., University of Georgia Medical Department, Augusta, 1908, president of the Broward County Medical Society, formerly assistant professor of anatomy at his alma mater, at one time health officer of Bambridge and Lafayette, Ga., chief of obstetric staff, Broward General Hospital, where he died August 21, aged 60, of cardiac asthma and pneumonia

Wilbur Merriam Judd @ Greystone Park, N. J., University of Vermont College of Medicine, Burlington, 1927, resident physician at the New Jersey State Hospital, died September 1, aged 42, of cerebral hemorrhage

William George Martin @ Columbus, Ohio, University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1911, for many years medical examiner for the Norfolk and Western Railroad Company, died in the White Cross Hospital August 30, aged 56, of cerebral hemorrhage

Benjamin F. Matheny @ Parsons, W. Va., Baltimore University School of Medicine, 1906, served as coroner of Harrison County, on the staff of the Tucker County Hospital, died September 8, aged 65, of coronary occlusion

Aloysius Alphonsus Mulligan, Harrison, N. J., Baltimore Medical College, 1905, died July 9, aged 63, of cardiovascular renal disease.

Henry Alphonse Paradis @ Sparks, Nev., Baltimore University School of Medicine, 1901; past president of the Nevada State Medical Association; member of the Pacific Association of Railway Surgeons, for many years division surgeon, Southern Pacific Company; served during World War I, at one time health officer of Sparks, member of the staffs of the St. Mary's and Washoe County General hospitals in Reno, died August 10, aged 66, of bronchogenic carcinoma

Harlow Orville Shockley, Darlington, Wis., Rush Medical College, Chicago, 1899, served an internship at the Presbyterian Hospital, Chicago, past president and secretary of the Lafayette County Medical Society; mayor of Darlington for seven years, president of the First National Bank of Darlington, died August 16, aged 71, of coronary thrombosis and chronic nephritis

Daniel Dewitt Van Voorhis, Beecher, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1893; for many years surgeon for the Chicago and Eastern Illinois Railroad, killed September 12, aged 70, when the automobile in which he was driving was struck by a truck

John T. Warford @ Lansing, Mich., Medical Department of Tulane University, New Orleans, 1891, member of the staff of the Edward W. Sparrow Hospital, died in Philadelphia July 30, aged 75, of acute cardiac failure

Herbert Tiffany Weston, West Hartford, Conn., Baltimore Medical College, 1890, for many years connected with the professional liability division of the Aetna Life Insurance Company, died in Hartford July 28, aged 75, of heart disease

Clarence Leon Wilson, Chicago, University of Illinois College of Medicine, Chicago, 1920, member of the Illinois State Medical Society, specialist certified by the American Board of Obstetrics and Gynecology; field consultant, division of maternal and child hygiene, State of Illinois Department of Public Health, senior associate attending obstetrician to the Provident Hospital, died August 28, aged 49, of carcinoma

John Russell Woods, Columbus, Ohio, Ohio Medical University, Columbus, 1904, died July 10, aged 63, of cerebral hemorrhage

Robert Elmore Wright @ Dallas, Texas, Atlanta College of Physicians and Surgeons, 1913; specialist certified by the American Board of Otolaryngology, member of the American Academy of Ophthalmology and Otolaryngology, Texas Ophthalmological and Otolaryngological Society, Dallas Academy of Ophthalmology and Otolaryngology, Southern Clinical Society and the Southern Medical Association, served as president of the general staff of the Medical Arts Hospital, died July 11, aged 57, of cardiorenal disease

DIED IN MILITARY SERVICE

Elmer Barney M. Casey @ St. Louis; National University of Arts and Sciences Medical Department, St. Louis, 1917, served during World War I, commissioned a captain in the medical reserve corps of the U. S. Army on Nov. 28, 1924, later promoted to major and lieutenant colonel; began active duty on July 15, 1941; died in the Walter Reed General Hospital, Washington, D. C., July 25, aged 51, of carcinoma of the intestine

James Halbert Gambrell, El Paso, Texas, Baylor University College of Medicine, Dallas, 1910, served an internship at St. Paul's and Baylor hospitals in Dallas, formerly instructor of surgery at his alma mater, served as chief of staff of the Masonic and El Paso County hospitals, formerly member of the city school board, in 1916 accepted a commission as lieutenant in the medical corps of the Texas National Guard and served on the Texas-Mexican border during the punitive campaign against Pancho Villa, served with the 36th division in France during World War I, commissioned a major in the medical reserve corps of the U. S. Army on Oct. 7, 1919, later promoted to lieutenant colonel and colonel, began active duty as a colonel on Jan. 21, 1942, served as commanding officer of the 51st, 67th and 96th General hospitals when these units, each in turn, were activated and trained for overseas duty, medical training officer of the military training division of the Eighth Service Command in Dallas, where he died April 23, aged 59, of coronary arteriosclerosis and coronary thrombosis

William Arthur Johnson @ Umontown, Pa.; University of Pittsburgh School of Medicine, 1935, served an internship at the Pittsburgh Medical Center; interned and served as assistant resident in obstetrics and gynecology at the New York Hospital, served a residency in obstetrics at the New York Polyclinic Medical School and Hospital in New York; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on June 5, 1935, began active duty on Dec. 5, 1940, promoted to captain in November 1941 and major in November 1942, went overseas in December 1943, killed while on duty as a flight surgeon in Gunnislake, England June 11, aged 32, in an aircraft accident

James Patrick Jordan, North Tonawanda, N. Y., St. Louis University School of Medicine, 1932, member of the Medical Society of the State of New York, diplomate of the National Board of Medical Examiners, member of the National Gastroenterological Association, specialist certified by the American Board of Internal Medicine, served an internship at the Buffalo Hospital of the Sisters of Charity and a residency in medicine at the Millard Fillmore Hospital, Buffalo, commissioned a lieutenant commander in the medical corps of the U. S. Naval Reserve on Sept. 5, 1942 and began active duty on Oct. 26, 1942, had been assigned to the Office of Naval Officer Procurement in Rochester, N. Y., died in the South Atlantic area off the coast of South America July 23, aged 44, of bronchopneumonia

Joshua Levitsky @ Philadelphia, University of Pennsylvania School of Medicine, Philadelphia, 1936; served an internship at the Mount Sinai Hospital, commissioned a first lieutenant in the medical corps, Army of the United States on Oct. 21, 1942, later promoted to captain, began active duty on Dec. 10, 1942, died in England, April 25, aged 31, as the result of injuries received in an airplane crash

Harry Meyer @ New York, University and Bellevue Hospital Medical College, New York, 1922, served an internship at St. Mark's Hospital, commissioned a major in the medical corps, Army of the United States, on Sept. 11, 1942, died in the Lawson General Hospital, Atlanta, Ga., August 4, aged 47, of malignant hypertension

Allen Sydney Morris, Buffalo, University of Buffalo School of Medicine, 1926, member of the Medical Society of the State of New York, interned at the Buffalo City Hospital; served on the staff of the Millard Fillmore Hospital, formerly connected with the city health department, commissioned a captain in the medical corps of the Army of the United States on July 27, 1942, later promoted to major, died at Camp Rucker, Ala., August 31, aged 43, of myocardial failure

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the
Food and Drug Administration of the
Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D.D.N.J. and foods, F.N.J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment]

Armi Mineral Water.—Ralph R. Markwood, trading as Armi Mineral Water Company, Toledo, Ohio. Shipped July 2 and August 15, 1940. Substantial amounts of sodium sulfate and lime, not more than 0.15 grain of silicon dioxide per quart (declared an insignificant quantity present in many city water supplies) and only traces of, if any, potassium diphosphate, manganese and potassium chlorides, magnesium, calcium, sodium and ferric phosphates, potassium iodide or lithium bromide. Misbranded because label falsely represented product to contain important and substantial amounts of the substances in the last named group. Also misbranded because label did not give the common or usual name of each active ingredient, since one of them was slaked lime, which label listed as calcium hydroxide. Further misbranded because label did not so list ingredients as to make them understood by the ordinary individual, with the exception of lime and sodium sulfate, which were present, if at all, in unimportant and inconsequential proportions. Misbranded again because of misleading zigzag design on label depicting lightning, and because the statement "Treated By Electrolysis" failed to reveal that any treatment by electrolysis to which the article may have been subjected had not affected its properties. Misbranded, finally, because label claim, "Scientifically Balanced," was false and misleading when applied to water to which had been added small amounts of lime and sodium sulfate and inconsequential amounts of other substances—[D.D.N.J., F.D.C. 777; September 1943.]

Floramucin.—Lawrence M. Williams, trading as Lawrence Laboratories, Chicago. Shipped Jan. 27 and March 7, 1941. Composition essentially the mucilaginous portion of psyllium seed, with karaya gum, sugar and dextrin. Misbranded because of misrepresentation that it would detoxify and be efficacious in treating biliousness, sore stomach, indigestion, intestinal stasis, excess gas, colitis, torpid liver, and stomach and bowel troubles; that it would combat constipation and colitis without laxatives, thus implying that it was not a laxative, that it would keep the digestive tract vigorous and healthy, insure quick and effective relief from faulty elimination, and do some other things, that it was not a drug or laxative, did not contain a gum, and was more than a bulk producing laxative—[D.D.N.J., F.D.C. 766, September 1943.]

Howell's Cocoa & Quinine Syrup.—Howell Company, Inc., New Orleans. Shipped between Feb. 21, 1940, and Jan. 6, 1941. Composition labeled to contain 2 grains of quinine sulfate per teaspoonful, whereas only 1.65 grains were found by analysis. Hence misbranded—[D.D.N.J., F.D.C. 807, December 1943.]

Mentho-Thymoline.—Standard Drug Company, Inc., Spartanburg, S. C. Shipped Feb. 28 and March 13, 1941. Composition essentially a mixture of small amounts of camphor, menthol and thymol, incorporated in a petrolatum base. Misbranded because labeling falsely represented product as a cure or treatment for inflammations, colds, croup, sore throat, burns, wounds, hemorrhoids, headache and earache, further misbranded because the name Mentho-Thymoline was misleading in suggesting that the product consisted solely of menthol and thymol, whereas it contained other active ingredients; also misbranded because label did not accurately declare the quantity of the contents—[D.D.N.J., F.D.C. 805, December 1943.]

Pitcher's Castoria.—Roma Extract Company, Inc., Boston. Shipped, Nov. 10, 1941. Composition essentially extracts of plant drugs, including senna, Rochelle salt (approximately 0.28 per cent), sodium bicarbonate (2.5 per cent), santonin (0.027 per cent) and flavoring materials, including methyl salicylate, with sugar and water. Misbranded because of false label claims: "A Reliable Remedy for . . . Diarrhea due to Constipation, Worms, and Promotes Sleep by Overcoming these Disorders," further misbranded because active ingredients were not listed on label in such terms as to make them easily understood by the ordinary individual. Also misbranded because label did not give the common or usual name of each active ingredient; misbranded, finally, because container was so made and filled as to be misleading, since carton was materially larger than necessary to hold the bottle—[D.D.N.J., F.D.C. 782, September 1943.]

Vi-Penta Drops 'Roche'.—Hoffman-La Roche, Inc., Nutley, N. J. Shipped April 22, 1941. Composition less than the claimed 9,000 units of vitamin A per 0.6 cc. Adulterated and misbranded for this reason. Also misbranded because falsely represented as efficacious for malnutrition, infections, anemias, tuberculosis, typhoid fever, diarrhea, colitis, diabetes, catarrhal jaundice, certain skin diseases (such as eczema), prophylaxis of abnormal dentition, and periods of vomiting, such as in infancy, childhood or pregnancy—[D.D.N.J., F.D.C. 774, September 1943.]

Correspondence

THE RELIEF OF PAINFUL THIGH STUMP AND SCIATICA

To the Editor:—In THE JOURNAL, April 8, page 1030, in his article on "Pain After Amputation and Its Treatment," Dr. J. C. White writes "In this discussion of intractable pain which may follow amputation I should like to begin by pointing out how little is known about it, and what an opportunity is awaiting surgeons in the military forces today for gaining a better insight into its mechanism, as well as for devising effective methods of treatment." The following case seems pertinent:

An aviator aged 30 crashed five years previously, the injury requiring supracondylar amputation of the right thigh; a few weeks later the stump became painful and was injected with saline solution. Then the sciatic nerve was alcoholized and one year later 4 inches of it was removed, but without relief, and he took to narcotics. On Jan. 27, 1944 he was suddenly seized with an excruciatingly severe and almost unbearable pain in the stump and was then referred to me by Coroner T. C. Goraczewski. He came in at 10 p. m. suffering agonizing pain in the sciatic nerve with tonic contraction of the hamstrings, which aggravated the pain. Employing a technic I devised and have been successfully using in sciatica I searched for and found a wining spot of tenderness over the sacral origin of the sacrospinalis in the dorsal hollow of the sacrum and injected it with 1 cc. of 2 per cent procaine hydrochloride, with instantaneous relief of the pain and disappearance of the tonic spasm. At the time of this writing (September 18) the patient states that the relief has been maintained, including freedom from the tickling sensations in the phantom ankle and toes of the amputated limb.

I suggest the following mechanism as being operative in these cases: In response to a peripheral irritation the piriformis and obturator internus (with the gemelli), from between which the sciatic nerve emerges, become spastic and pinch the nerve. This peripheral irritant is removed by anesthetization of the posterior sacral plexus, whose fibers emerge from the upper four sacral foramina to enter the multifidus to supply it with motor fibers. Relief of the ordinary case of sciatica ensues quite regularly in seven minutes when clocked, and as the pain vanishes muscle stiffness or spasm disappears and pain present in the hip joint or knee joint is relieved. In some cases there will be a tender spot over each of the upper four sacral foramina, each requiring an injection. In this region I use a 1 inch needle (preferably a B-D Huber point, which is much less painful to introduce) attached to an ordinary hypodermic syringe (I prefer a tuberculin syringe): the needle is boldly plunged through each tender spot up to its hilt so as to reach the multifidus and therefore the fibers of the posterior sacral plexus, and from 0.5 to 1 cc. of 2 per cent procaine is deposited for each spot.

The following case of sciatica in civilian practice exemplifies the suggested etiology and treatment:

H. F., a man aged 53, an electrical engineer, referred by Dr. Harry Goldblatt of the Western Reserve University Medical School, Cleveland, walked into the office with an obviously painful limp on the left side. He stated that on July 27, 1944 after a sudden, peculiar twist when lifting a 25 pound bag a pain was suddenly felt low in the back on the left side and became excruciatingly severe. Twenty-four hours after treatment by a physical therapist on August 25 pain began in the left sciatic nerve, and the left foot began to drag. His present (September 20) complaint is of pain in the left sciatic nerve, constant, stabbing and aching, not aggravated by coughing or sneezing. There is numbness of the foot from its sole up along the outer side of the left leg to about its middle, with partial foot-drop and inability to extend the toes. Wincing tenderness

is present over the left sacroiliac joint and over the posterior sacral foramina on the same side. The joint was injected with 1 cc. of 2 per cent procaine hydrochloride, as was each sacral wincing spot. Ten minutes later the patient could weakly extend the toes and walk without a limp, and he noticed that the numbness was leaving the foot, outer side first. Examination on the succeeding three days showed continued improvement and finally complete relief from all symptoms.

This situation can definitely be explained by assuming a minor strain of the sacroiliac joint as the peripheral irritant for spasm of the piriformis and obturator internus via the sacral plexus squeezing between them the sciatic nerve and producing a full blown sciatica. Injection of the joint and wincing spots released the grip of the muscles on the nerve, with clearance of the symptoms and signs.

Of late I have been substituting this method for lumbar sympathetic plexus block in cases of vascular disturbances of the lower extremity, the results of which I shall report later.

I sincerely hope that these same results will be obtained in the hands of others. If so our boys with painful thigh stumps can avoid the formidable operations Dr. White (unwillingly I am sure) finds it necessary to practice, while in civil practice the at times hazardous direct blocking of the sciatic nerve itself may be avoided.

P. G. SKINNER, M.D. South Bend Ind.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and of Examining Boards in Specialties were published in *THE JOURNAL*, Oct. 14, page 451.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Oct. 24-26. Sec., Dr. B. F. Austin. 519 Dexter Ave., Montgomery.

ARKANSAS: * Little Rock, Nov. 9-10. Sec., Dr. D. L. Owens. Harrison.

CALIFORNIA: * Oral. San Francisco, Nov. 15. Sec., Dr. Frederick A. Senter. 1020 N. St., Sacramento 14.

CONNECTICUT: * Medical. Written. Hartford, Nov. 14-15. Endorsement. Hartford, Nov. 28. Sec. to the Board, Dr. Creighton Barker, 48 Church St., New Haven. Homeopathic. Derby, Nov. 14-15. Sec., Dr. J. H. Evans, Hartford 6.

DISTRICT OF COLUMBIA: * Washington, November. Sec., Commission on Licensure. Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, Nov. 20-21. Sec., Dr. Harold D. Van Schaick, 2736 S.W. Seventh Ave., Miami 36.

IDaho: Boise. Jan. 8-11. Dir., Bureau of Occupational Licenses. Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

INDIANA: Indianapolis. Jan. 3-5. Exec. Sec., Board of Medical Registration and Examination, Miss Ruth V. Kirk. 301 State House, Indianapolis 4.

KANSAS: Nov. 2-3. Sec., Board of Medical Registration and Examination, Dr. J. F. Haggis. 905 N. Seventh St., Kansas City.

MAINE: Portland. Nov. 14-15. Sec., Board of Registration of Medicine. Dr. A. P. Leighton. 192 State St., Portland.

MARYLAND: Homeopathic. Baltimore, Dec. 1-3. Sec., Dr. John A. Evans. 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston. Nov. 14-17. Sec., Board of Registration in Medicine, Dr. H. Q. Galluppe. 413 F. State House, Boston.

NEVADA: Carson City, Nov. 6. Sec., Dr. G. H. Ross. 215 N. Carson St., Carson City.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williamson. 41 S. 3rd St., Grand Forks.

SOUTH CAROLINA: Columbia, June 25-27. Sec., Dr. N. B. Howard. 1129 Blenheim St., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 16-17. Sec., Medical Licensure, State Board of Health. Dr. G. Cottam, Pierre.

TEXAS: Dallas. Nov. 15-17 and Dec. 19-21. Sec., Dr. T. J. Crowe. 918-20 Texas Bank Bldg., Dallas 2.

VIRGINIA: Richmond, June 20-23. Sec., Dr. J. W. Preston. 61 Franklin Rd., Roanoke.

WASHINGTON: * Seattle. Jan. 15-17. Dir., Department of Licensure. Mr. Thomas A. Swartz, Olympia.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: Little Rock. Oct. 30. Sec., Mr. I. E. Gebauer, 701 Main St., Little Rock.

COLORADO: Denver, Dec. 6-7. Sec., Dr. Esther B. Starks. 1459 Ogden St., Denver.

DISTRICT OF COLUMBIA: Washington, Oct. 23-24. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

NEW MEXICO: Santa Fe, Feb. 12. Sec., Miss Marion M. Rhea, State Capitol, Santa Fe.

OREGON: Portland. Nov. 4. Sec., Mr. C. D. Byrne. University of Oregon, Eugene.

RHODE ISLAND: Providence. Nov. 15. Chief Division of Examiners. Mr. Thomas B. Casey. 366 State Office Bldg., Providence.

SOUTH DAKOTA: Aberdeen. Dec. 1-2. Sec., Dr. G. M. Evans, Yankton.

WISCONSIN: Milwaukee. Dec. 2. Sec., Prof. R. A. Pauer. 152 W. Wisconsin Ave., Milwaukee 3.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals Not for Profit: State Unemployment Compensation Act Not Applicable to Charitable Hospital.—The Scripps Memorial Hospital, Inc., is a nonprofit organization organized under the laws of the state of California conducting a hospital, a metabolic clinic and a dietetic school. In accordance with the purposes for which it was founded, it treats persons regardless of race, creed or ability to pay, although it receives pay from about 75 per cent of the patients admitted, a full charge being made to patients with the ability to pay, a lesser charge being made in proportion to a patient's ability to pay and no charge being made if the patient is unable to pay. All sums received from the care of patients are used in the maintenance of the hospital and no profit from the hospital's operation has been used for any other purpose. Sometime subsequent to the adoption of the federal social security act appropriate federal officials ruled, in accordance with provisions in the law that authorize an exemption for such a corporation, that the corporation was exempt from the payment of the taxes required by title IX of that act (the title that was designed to aid the several states in the operation of systems of unemployment compensation) on the ground that the hospital corporation was exclusively organized and operated for charitable purposes and that no portion of its funds inures to the benefit of any private individual or shareholder. In 1936 the corporation was exempted also from the payment of taxes under the California unemployment compensation act by reason of section 7 (g) of that act, which exempts from the payment of taxes "a corporation, community chest, fund or foundation, organized and operated exclusively for religious, charitable, scientific, literary or educational purposes or for the prevention of cruelty to children or animals, no part of the net earnings of which inures to the benefit of any private shareholder or individual."

In 1941 the California employment commission revoked this exemption but granted an exemption under a section added in 1939 to the California unemployment compensation act, namely section 7 (k), which grants an exemption to a nonprofit organization, nonprofit safety organization, chamber of commerce service club or fraternal organization not subject to a tax under title IX of the social security act. In March 1942 the commission revoked that exemption and the hospital corporation paid unemployment compensation taxes under protest. Subsequently it instituted three suits to recover the taxes so paid, all of which actions were consolidated for trial. The trial court held that the hospital was exempt from paying taxes under both sections 7 (g) and 7 (k) of the unemployment compensation act and entered a judgment for the corporation. The commission then appealed to the district court of appeals, fourth appellate district, which affirmed the judgment in favor of the

hospital (*Scrapps Memorial Hospital, Inc., v. California Employment Commission* 143 P (2d) 364). On further appeal the Supreme Court of California affirmed the judgment of the district court of appeal and adopted, in toto, as its decision the opinion rendered in the intermediate court.

The employment commission contended that the hospital corporation was not entitled to exemption as an organization exclusively organized and operated for charitable purposes because only a small part of its operations were purely charitable in the sense that they are services rendered gratuitously to persons that are unable to pay therefor. But, answered the court, it has generally been held that the fact that fees are charged by an institution such as the hospital here involved is not controlling if those fees go to pay the expenses of operation and not to the profit of the founders or shareholders. It is also usually held that it is immaterial that such an institution is supported in part by full pay or part pay patients and that it is the use to which any profit or income is devoted which is controlling. The court thought it clear that the hospital was intended to be included in the exemption provided in the unemployment compensation act.

In defining the phrase, continued the court, "operated exclusively for . . . charitable . . . purposes" as used in the act, in conformity with the purpose of the law makers, the context and surrounding provisions of that section should not be overlooked. Among the organizations which are to be exempted are community chests and funds or foundations which ordinarily include in their scope and operations many things aside from the relief of the poor and needy, in the strictest sense of the word charity. Again, the organizations to be exempted include also those organized and operated for religious, scientific, literary or educational purposes, and even those for the prevention of cruelty to children or animals. The wide and varied nature of the exemptions thus provided rather clearly indicates a purpose and intention to give the words here in question a broad rather than a strict meaning, and that it was intended, for exemption purposes, to apply the sort of standards to charitable institutions that are applied to the others named. In the broader meaning of charitable purposes the general principle usually applied in cases in this and other states is that such an institution as a hospital, in order to come within the meaning, must be one that is open to all persons irrespective of race, color, creed or ability to pay and must be one from which no individual or entity may benefit or profit from its operations or assets on dissolution. That the legislative purpose and intention in adopting the language used in the section under discussion were as we have suggested is also indicated by the fact that, although the employment commission had for some years thus interpreted this section, as shown by its exemption of the hospital through all those years, the legislature in extensively revising the unemployment compensation act in 1939 made no change in that regard but instead enlarged the scope of such exemptions by adding a new subsection 7 (k). That new section provided for an additional exemption with respect to nonprofit organizations, nonprofit safety organizations, chambers of commerce, service clubs and fraternal organizations which are not subject to tax under title IX of the social security act.

That this was the intention of the legislature, continued the court, is further indicated by the fact that this act was adopted as a part of a plan for a uniform system of unemployment compensation then proposed and later adopted by the federal government in practically all of the American states. The language used in section 7 (g) of the section providing exemption for charitable organizations, is practically identical with that used in similar sections of the federal legislation and that of many states and is precisely similar to the language used in other federal statutes that have been in effect for many years. For that reason the interpretation placed on the language by the federal and other courts is unusually persuasive here. In passing on practically the same language in a case involving quite similar facts the Supreme Court of the United States in *Trinidad v. Sagrada de* 263 U. S. 578 44 S. Ct. 204 said

The exceptions covered, among others any corporation "organized and operated exclusively for religious, charitable, scientific or educational purposes no part of the net income of which inures to the benefit of any private stockholder or individual . . ."

Two matters apparent on the face of the clause go far toward settling its meaning. First, it recognizes that a corporation may be organized and operated exclusively for religious, charitable, scientific or educational purposes and yet have a net income. Next, it says nothing about the source of the income but makes the destination the ultimate test of exemption.

That the transactions yield some profit is in the circumstances a negligible factor. Financial gain is not the end to which they are directed.

Our conclusion is that the plaintiff is organized and operated exclusively for religious, charitable and educational purposes within the meaning of the exempting clause.

In passing on a similar question involving the same language as used in the New York unemployment compensation act the court said in *re Mendelsohn*, 262 App. Div. 605, 31 N. Y. S. (2d) 435.

The record shows that the hospital was organized exclusively for hospital purposes and is engaged exclusively in operating a hospital of a nonprofit character.

That fees are charged by a university or hospital is not controlling as to its being a charity, for only when such income is devoted to the profit of the founders and not used to carry on the work by adding to the endowment, etc., does it show the institution is a business and not a charity.

"A hospital association not conducted for profit which devotes all of its funds including those received from patients, exclusively to the maintenance and improvement of the institution is, therefore, a charity in every sense of the word."

Charitable purposes include nonprofit hospital corporations, organized and operated exclusively for hospital purposes irrespective of whether they charge their benefactors for their services and facilities.

The same interpretation has been given this or similar language in *Virginia Mason Hospital Ass'n v. Larson*, 114 P (2d) 976, and *Commissioner of Internal Revenue v. Battle Creek*, 126 F (2d) 405.

For the reasons stated the finding of the trial court that the hospital corporation was entitled to exemption from the payment of taxes under the unemployment compensation act was affirmed.—*Scrapps Memorial Hospital, Inc., v. California Employment Commission*, 151 P (2d), 109 (Calif., 1944).

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics, St. Louis, Nov. 9-11 Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary
- Annual Conference of State Secretaries and Editors, Chicago, Nov. 17-18 Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary
- Association of American Medical Colleges, Detroit, Oct. 23-25 Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary
- Association of Military Surgeons of the United States, New York, Nov. 2-4, Col. James M. Phalen, Army Medical Museum, Washington 25, D. C., Secretary
- Central Neuropsychiatric Association, Chicago, October 31 Dr. Ernest M. Hammes, 1124 Lower Medical Arts Bldg., St. Paul 2, Minn., President
- Central Society for Clinical Research, Chicago, Nov. 3-4 Dr. Carl V. Moore, 602 S. Euclid Ave., St. Louis 10, Secretary
- Midwestern Section of American Federation for Clinical Research, Chicago, Nov. 2 Dr. Richard H. Lyons, University Hospital, Ann Arbor, Mich., Secretary
- Oklahoma City Clinical Society, Oklahoma City, Oct. 23-26 Dr. I. C. McHenry, 512 Medical Arts Bldg., Oklahoma City, Secretary
- Omaha Mid West Clinical Society, Omaha, Nebraska, Oct. 23-27 Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha 2, Secretary
- Puerto Rico Medical Association of, Santurce, Dec. 15-17 Dr. E. Martinez Rivera, P. O. Box 3866, Santurce, Secretary
- Southern Medical Association, St. Louis Mo., Nov. 13-16 Mr. C. P. Loran, Empire Building, Birmingham 3, Ala., Secretary
- Virginia Medical Society of, Richmond, Oct. 23-25 Miss Agnes V. Edwards, 1200 E. Clay St., Richmond 19, Secretary
- Western Surgical Association, Chicago, Dec. 1-2 Dr. Arthur R. Metz, 250 East Superior St., Chicago, Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Fort Wayne, Ind.

11:241-270 (Aug.) 1944

- Relationship Between Lymphoblastic Tumor and Digestive Tract J Borak —p. 241
On Absorption of Iron, V L Henderson and G H W Lucas —p. 244
Neurotic Patient: Discussion of Causes and Treatment of Neurosis H Gauss —p. 248
Dysentery in American Troops in Middle East C W Wints Jr. and E J Tallant —p. 252
Chronic Constipation H W. Sopes —p. 255
Constipation: Further Clinical Evidence of Use of Bran as Dietary Laxative Agent M H Streicher and Lucille Quirk —p. 259
Fat Metabolism, H M. Gembhatt —p. 260
Role of Fat Soluble Vitamins A and D in Nutrition J Buckstein —p. 261

American Journal of Diseases of Children, Chicago

68:1-82 (July) 1944

- *Relationship of Tonsils and Adenoids to Type of Poliomyelitis. Analysis of 432 Cases P. F. Lucchesi and A C LaBocchetta —p. 1
*Sulfadiazine in Treatment of Diarrhea in Children I J Menchaca —p. 5
Thumb and Finger Sucking in Relation to Feeding in Early Infancy F Roberts —p. 7
*Poisoning Due to Lye: Value of Bokay Prophylactic Dilation in Prevention of Early Strictures of Esophagus I T Crowe —p. 9
Study of Personalities of Children with Diabetic Wmfred C Loughlin and H O Mosenthal —p. 13
Basal Blood Pressure and Pulse Rate in Adolescents N W Shock —p. 16
Effects of Repeated Use of Sulfadiazine for Recurring Acute Infections of Respiratory Tract M Siegel —p. 23

Relationship of Tonsils and Adenoids to Poliomyelitis.

—Lucchesi and LaBocchetta investigated the question of whether the presence or absence of tonsils has any relationship to the type or mortality of poliomyelitis. The material for the study included 432 patients admitted to the Philadelphia Hospital for Contagious Diseases with diagnosis of acute anterior poliomyelitis from 1937 to 1942 inclusive. The authors apply the term "spinal poliomyelitis" to designate the condition in which only the spinal cord is involved. The term "bulbar poliomyelitis" is used when cranial nerves alone are involved. The condition in which both the cranial nerves and the spinal cord are involved is classified as "bulbospinal poliomyelitis." There were 19 patients under 6 years of age who had had their tonsils and adenoids removed and 8 of these children had bulbar involvement. Of 161 patients in the nonadenoidotonsillectomized group under 6 years of age only 13 had bulbar involvement. Eighteen of 432 patients died. Of these 3 had bulbar, 5 had spinal and 10 had bulbospinal poliomyelitis. Fourteen of the patients who died had had tonsillectomy and adenoidectomy. The authors analyze the types of poliomyelitis occurring in 164 adenoidotonsillectomized patients and in 263 patients with intact tonsils and adenoids. Over 70 per cent of the patients with bulbar poliomyelitis and 61 per cent of those with bulbospinal poliomyelitis had had an adenoidotonsillectomy, while only 30.9 per cent of the patients with only spinal involvement had had their tonsils and adenoids removed. Nonparalytic poliomyelitis occurred in about equal proportions in the two groups. The consistency of the data adds weight to the belief that a positive correlation exists between absence of pharyngeal lymphoid tissue and involvement of the higher centers in poliomyelitis. Some believe that an adenoidotonsillectomy must occur within the incubation period of the disease in order to have any effect on the course of the illness. The evidence presented here

suggests that the absence of tonsils and adenoids increases the risk of bulbar and bulbospinal involvement in persons with poliomyelitis. Consequently the indiscriminate removal of tonsils and adenoids should not be condoned.

Sulfadiazine in Diarrhea in Children.—Menchaca employed sulfadiazine in infantile diarrhea. Most of his patients had severe or moderate diarrhea that had not improved under treatment in outpatient clinics. Injections of isotonic solution of sodium chloride with dextrose were given, and isotonic solution of three chlorides with 3 per cent dextrimaltose was administered by mouth. The diet consisted of either buttermilk with dextrimaltose or human milk. Only 2 patients received plasma, and the use of antidiarrheals was avoided. A total of 0.1 to 0.15 Gm of sulfadiazine per kilogram of body weight was given daily in four doses six hours apart. From observations on 20 children the author concludes that this drug is an efficacious aid in the treatment of infantile diarrhea.

Prophylactic Dilation for Strictures of Esophagus from Lye.—According to Crowe, corrosive burns of the esophagus constitute one of the most difficult problems in pediatric practice. He analyzes 57 cases of ingestion of caustic alkali. The first aid given is generally poor. Patients with early poisoning due to lye can be saved secondary stenosis of the esophagus by the use of Bokay prophylactic esophageal dilation. This treatment should be used for every patient who has swallowed alkali unless there is definite pharyngoscopic proof that the esophagus is undamaged. If the presence of oral burns or the conditions revealed by fluoroscopy or pharyngoscopy indicate that the esophagus has been damaged even slightly, an eyeless (Bokay) catheter size 10 to 30 (French) which has been filled with lead shot or mercury, tied off at the open end and wet with water or with lubricating jelly, should be gently passed down the child's esophagus and left in place for five minutes once daily, starting on the third day after the child swallows the lye or as near that time as possible. The catheter should not be forced but allowed to pass by weight of the shot or mercury contained in it. During the first few days the size of the catheter should be increased until difficulty is encountered in passing it. From the third to the tenth week the largest possible catheter should be passed once daily and kept in place for ten to thirty minutes. The catheter should be introduced twice a week for the next month and then once a week for at least three months; then the interval can be lengthened to suit the patient's condition. Only 13 of the patients were seen in a sufficiently early stage so that Bokay prophylactic therapy could be used. In the 9 patients for whom Bokay therapy was adequate no strictures of the esophagus occurred. In 4 children the treatment at home was not sufficiently prolonged and strictures developed, necessitating a second admission to the hospital for gastrostomy and bougienage. Strictures developed also in 44 children who did not have Bokay treatment. All the patients with strictures required one of the following types of treatment: (1) peroral esophagoscopic bougienage, (2) retrograde bougienage through an artificial gastric fistula or (3) peroral bougienage with a silk thread used as a guide, procedures which involve long hospitalization (an average of fifty-six days), inconvenience, expense and the possibility of death from surgical causes. Four of the 48 patients died.

American Journal of Hygiene, Baltimore

40:1-108 (July) 1944

- *Propagation of Yellow Fever Virus in Tissue Cultures Containing Sulfonamides H. Koprowski and E H Lennette —p. 1
*Sulfonamides in Yellow Fever Virus Infections of Mice and Developing Chick Embryos H. Koprowski and E H Lennette —p. 14
Nuclei in Asian Malaria Parasites. I. Structure of Nuclei in Plasmodium Elongatum with Some Considerations on Technique T T Chen —p. 26
Jaundice in Army Personnel in Western Region of United States and Its Relation to Vaccination Against Yellow Fever (Parts II, III and IV). W. A. Sawyer, K F Meyer, M D Eaton, J H Bauer, P Putnam and F F Schweitzer —p. 35

Sulfonamides and Yellow Fever in Cultures.—Koprowski and Lennette cultivated the 17DD High substrain of yellow fever in tissue culture in the presence of maximal concentrations of sulfapyridine or sulfathiazole. No evidence was obtained that

either of these drugs interferes with the propagation of the virus. No changes in the infectivity of the virus for mice were noted after fifty passages in tissue culture medium containing sulfapyridine.

Sulfonamides in Yellow Fever of Mice and Chick Embryos.—Koprowski and Lennette found that sulfapyridine and sulfathiazole administered orally or parenterally and sodium sulfapyridine administered parenterally had no demonstrable prophylactic or therapeutic effect on mice infected with yellow fever virus. Sodium sulfapyridine administered by way of the chorioallantoic membrane had no effect on the course of the infection produced in the chick embryo inoculated on the membrane with virus prior to or after administration of the drug.

American Journal of Ophthalmology, Cincinnati

27:803-932 (Aug.) 1944

- Type of Foxcomaculac Retinitis Observed in U S Navy F C Cordes —p 803
Choice of Fixating Eye in Paralytic and Nonparalytic Strabismus J W White.—p 817
Exophthalmos of Hyperthyroidism Differentiation in Mechanism, Pathology, Symptomatology and Treatment of Two Varieties Part III. J. H. Mulvaney.—p 820
Inclusion Blepharitis J. H. Allen.—p 833
Etiology and Treatment of Tobacco Alcohol Amblyopia Part II F D Carroll.—p 847
X-Ray Treatment of Thrombosis of Retinal Vein and of Several Types of Irregularities R. J. Hessberg.—p. 864
Almost Complete Retinal Detachment After Cataract Extraction Complete Reattachment After Glaucoma Attack F Nelson.—p 876

American Journal of Public Health, New York

34:817-930 (Aug.) 1944

- Cooperative Health Program of American Republics G C Dunham —p. 817.
Wartime Nutrition in England as Public Health Problem H M Sinclair.—p 828.
Staphylococcus and Streptococcus Carriers: Sources of Food Borne Outbreaks in War Industry V A Gettling, A D Rubenstein and G E Foley.—p 833
Salmonellosis as Public Health Problem in Wartime A D Rubenstein, R F Peemster and Helen M Smith.—p 841
Food Poisoning Caused by Hemolytic Staphylococcus in Defense Plant B. J. Slater and J. L. Norris.—p 854
Housing Health Department—Experiment in Rural Oklahoma Gertrude Nielsen and H. L. Kamphoefner.—p 857.
Automatically Controlled Suction Device for Field Air Sampling A Satteldind.—p 863

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

52:1-122 (July) 1944

- Osseous Metastases from Gravid Cancers of Breast, with Particular Reference to Roentgen Treatment H A Burch.—p 1
Some Experiences in Treatment of Bronchial Cancer W L Matlack.—p 24
Cardiac Aneurysm P J Delano and A R Weihe.—p 31
Tuberos Sclerosis M D Sachs and D. A. Shaskan.—p 35
Roentgenologic Diagnosis of Peptic Ulcer of Esophagus F J Lust and A R Peskin.—p 40
Normal Distribution of Small Intestine S T Herstone and S Freund.—p 46
Position of Small Intestine as Determined Roentgenographically M H Poppel and S T Herstone.—p 52.
Spinal Extradural Cyst (Diverticulum of Spinal Arachnoid) Report of Case C A Good, A W Adson and K H Abbott.—p 53
Roentgen Interpretation of Pathology in Pott's Disease O Auerbach and Marguerite G Stemmerman.—p 57
"Ring" Sequestrums as Complication of Fixed Skeletal Traction C P Truog.—p 64
Osteoid Osteoma Review of Portions of Literature and Presentation of Cases R W Lewis.—p 70
Pancreatic Cyst and Lithiasis Classification and Incidence, Report of Pseudocyst Associated with Disseminated Parenchymal Calcification. L M Pascucci.—p 80

Tuberous Sclerosis.—According to Sachs and Shaskan tuberous sclerosis is a rare hereditary disease of ectodermal origin. Tuberous sclerosis, Recklinghausen's neurofibromatosis and trigeminal nevus with angioma of the brain are distinct types of neurocutaneous syndromes. Of the three, tuberous sclerosis presents the most clearcut clinical, roentgenologic and pathologic picture. It is most frequently associated with mental retardation and epileptic seizures. The authors describe a case of tuberous sclerosis in a white soldier aged 32. The cardinal findings in this case with a history of epileptic seizures were adenoma sebaceum, fibromatous nodules on the forehead, scalp and back, pigmented hairy nevus of the lumbar area,

viteligo of the left thigh and back, phacoma of the retina, and "cotton ball" calcifications of the brain, right greater trochanter and fifth lumbar vertebra. The authors think that delay in the diagnosis of tuberculous sclerosis is probably due to the physician's unfamiliarity with the syndrome because of relative scarcity.

"Ring" Sequestrums as Complication of Fixed Skeletal Traction.—Truog points out that a complication which occurs not uncommonly with skeletal traction is the formation of "ring" sequestrum. He has observed 7 such cases at an orthopedic clinic. Six of the patients were treated with pins incorporated in plaster casts which extended from the toes to above the knees with about 15 degrees flexion at the knees. They then became ambulatory and were seen in the outpatient clinic. Five of these 6 patients had pins inserted through the upper tibial fragment and the calcaneus; one had a pin driven through the distal fragment as well as the proximal fragment. These 6 all had delayed union. The seventh patient was treated with the Kirschner wire extension. He had a fracture of the femur and humerus and of the tibia and fibula. Non-union developed in both the femur and the tibia necessitating bone grafts. Roentgenologists should give special attention to such cases, as the diagnosis will depend entirely on the roentgen examination. It is important to make the diagnosis as soon as possible so that the skeletal traction may be removed. Constant traction under these conditions may lead to extensive bone damage or to migration of the pin out of the bone into soft tissue, epiphyses or joints. The cause is probably pressure necrosis plus a low grade infection.

Annals of Internal Medicine, Lancaster, Pa.

21:1-172 (July) 1944

- Great Need for Internists in Naval Medical Program R T. McIntire —p 1
Demerol New Synthetic Analgetic, Spasmolytic and Sedative Agent: I. Pharmacologic Studies F. T. Yonkman, P. H. Noth and H H Hecht.—p 7.
Id. II Clinical Observations P. H. Noth, H H. Hecht and F F Yonkman.—p. 17.
Serum Amylase in Mumps. I. L. Applebaum.—p 35
Rheumatic Fever Diet as Predisposing Factor. D. C. Peete.—p 44
Short PR Interval Associated with Prolongation of QRS Complex. Clinical Study Demonstrating Interesting Variations O A Palatucci and J E Knighton.—p. 58
I. Treatment of Experimentally Produced Staphylococcal Thoracic Empyema. W. E. Evans Jr., J. G. McAlpine, B Sklarelic and E H Tonolla.—p. 70
Spontaneous Complete Rupture of Aorta without Dissecting Aneurysm, with Report of Case Showing New Physical Sign (Periaortic Friction Rub) F. R. Taylor and R. P. Morehead.—p. 81.
Evaluation of Dark Test. P. H. Woska.—p 101
Effect of Certain Antacids in Man Measured by Simplified Method for Continuous Recording of Gastric pH N. E. Rossett and J Flexner.—p 119

Clinical Observations with Isonipicaine.—Noth and his associates made observations on the effect of isonipicaine on 146 patients, 118 of whom were suffering pain severe enough to justify the use of one of the opiates. The customary dose was 100 mg. given orally or intramuscularly. The drug was administered in 123 instances of severe pain to 118 patients (5 patients had two types of pain). Complete relief was obtained in 79, partial relief in 29 and no relief in 15 instances. The onset of relief was from five to twenty minutes following intramuscular injection and from twenty to thirty minutes following oral administration. Its duration varied between one and six hours but was usually three or four hours. Relief was more often complete following intramuscular injection. The analgetic potency of isonipicaine in the dose employed was greater than that of 1 grain (0.06 Gm.) or more of codeine or combinations of codeine and acetylsalicylic acid. It was usually less than that of morphine in $\frac{1}{4}$ or $\frac{1}{2}$ gram (0.016 or 0.01 Gm) doses. The sedative action of isonipicaine was studied in the group of 81 patients with pain and in 24 patients without pain. The group of patients with pain received, as a rule, only a few doses of isonipicaine. Its administration was followed by sleep in about 50 per cent. by mild sedation in about 30 per cent and by no noticeable sedative effect in about 20 per cent of instances. The hypnotic or sedative effects following repeated administration were not profound, a fact which was of advantage in the treatment of

patients with chronic painful diseases. Three of 4 patients suffering from status asthmaticus were benefited by isonipecaine. Side effects were noted by 40 of the 146 patients, but in only 7 was it necessary to stop the drug. Laboratory studies showed no changes which could be attributed to it. In 9 of 21 patients who had received isonipecaine for varying periods of time the withdrawal of the drug and the substitution of one of the opiates were followed by certain undesirable symptoms. Isonipecaine is an effective analgetic drug which is relatively nontoxic. It may possess addictive properties, but these are apparently not as severe as those of some of the opiates. Isonipecaine is capable of replacing these drugs for a great number of painful conditions.

Annals of Surgery, Philadelphia

120:1-128 (July) 1944

- Treatment of Air Force Combat Casualties. W. F. MacFee.—p. 1.
Whole Upper Extremity Transplant for Human Beings: General Plans of Procedure and Operative Technique. R. H. Hall.—p. 12.
Studies on Effects of Posture in Shock and Injury. G. W. Duncan, S. J. Sarnoff and C. M. Rhode.—p. 24.
Operation for Aneurysm of Heart. C. S. Beck.—p. 34.
Infected Dissecting Aneurysm of Iliac Artery Following Arteriovenous Fistula of Femoral Vessels. H. Neuhaef.—p. 41.
Ligation of Abdominal Aorta: Case Report. J. K. Ormond, H. N. Harkins and F. J. Smith.—p. 49.
Surgical Aspects of Pancreatic Fistula. T. B. Wiper and J. M. Miller.—p. 52.
Primary Gastric Resection for Perforated Gastroduodenal Ulcers. A. Strauss.—p. 60.
Atresia of Small Intestine: Two Case Reports; One Multiple Atresia with Survival. W. H. Erb and D. C. Smith.—p. 66.
*Cauda Equina Compression Syndrome with Herniated Nucleus Pulposus: Report of 8 Cases. J. D. French and J. T. Payne.—p. 73.
Lumbosacral Roentgenograms of 450 Consecutive Applicants for Heavy Work. L. W. Breck, J. W. Hillsman and W. C. Basom.—p. 88.
Comparative Values of Various Methods of Resuscitation. S. A. Thompson.—p. 94.
*Studies on Surgical Convalescence: I. Sources of Nitrogen Loss Postgastrectomy and Effect of High Amino Acid and High Caloric Intake on Convalescence. Co Tui, A. M. Wright, J. H. Mulholland, V. Carabba, I. Barcham and V. J. Vinci.—p. 99.

Cauda Equina Compression Syndrome with Herniated Nucleus Pulposus.—French and Payne observed a number of instances in which the protrusions of nucleus pulposus were so extensive as to produce complete, or nearly complete, subarachnoid block with cauda equina compression. The resultant symptoms so closely simulate cauda equina tumors that in most of the early cases exploration was done for suspected neoplasms. The authors gained the impression that cauda equina compression occurs much more frequently as the result of herniated nucleus pulposus as of tumor. They present 8 cases of cauda equina compression due to herniated nucleus pulposus. These cases were proved by myelography and operation. The pathologic process was encountered at the third lumbar in 1 case, at the fourth lumbar in 4 cases and at the fifth lumbar in 3 cases. There is considerable similarity in the symptom complex presented by these patients. Their main complaints were pain in the back and both legs, numbness in the saddle area and/or both legs, weakness and sphincter disturbances. There is usually a long antecedent history of back pain followed by an acute episode of rapid progression of the symptoms. The predominant symptoms were weakness or atrophy in the gluteal region or both legs, sensory changes in both legs, multiple reflex changes and sphincter abnormalities. Narrowed interspace determined by x-ray was frequently present and of differential diagnostic importance when found. Increased spinal fluid protein was the rule. Myelography showed complete or nearly complete subarachnoid block in all cases. The difficulty in differentiating this clinical entity from cauda equina tumor preoperatively is apparent.

Nitrogen Loss After Gastrectomy.—Co Tui and his associates reported in a preliminary communication that patients convalescing from gastrectomy, when fed with a high caloric and high amino acid diet (nutramigen), were able to maintain a consistently positive nitrogen balance throughout the postoperative period, to register a rise in body weight and to achieve an early return of strength and a significantly shortened convalescence. This picture was in contrast to that of a similar group of postoperative patients under the classic postoperative ward regimen, who had a consistently negative nitrogen balance,

a loss of body weight, a longer period of postoperative debility and a more prolonged stay in bed. The authors now report the results of treating a group of 19 patients, 8 of whom were on routine ward regimen, 8 were fed high caloric and high amino acid mixture, and 3 were fed in sufficient quantities to maintain nitrogen equilibrium. Under the classic ward regimen there was a consistent nitrogen deficit and loss of weight and a prolonged stay in bed. Objective ergography also showed postoperative asthenia, which had not disappeared on the twelfth postoperative day. In those fed with high caloric and high amino acid mixtures there was a consistent nitrogen surplus, a steady gain in weight and a stay in bed of less than one-half that of the control series. The ergograph showed an early return of endurance. The principal cause of nitrogen loss in postgastrectomy convalescence was the starvation postoperative regimen. The nitrogen loss resulting from the gastric suction was considerable. It was correctable by feeding an early assimilable high amino acid mixture. A hyperalimentation regimen consisting of high caloric and high amino acid feeding postoperatively has been worked out and found practical and is recommended in gastrectomy in order to circumvent nitrogen loss, shorten convalescence and prevent postoperative asthenia.

Archives of Neurology and Psychiatry, Chicago

52:1-86 (July) 1944

- Lesion in Peripheral Nerve Resulting from Compression by Spring Clip. D. Denny-Brown and C. Brenner.—p. 1.
Dystonia: III. Pathology and Conclusions. E. Herz.—p. 20.
Cerebral Thromboangiitis Obliterans: Histogenesis of Early Lesions. I. M. Scheinker.—p. 27.
Electroencephalogram of Criminals: Analysis of 411 Cases. D. Silverman.—p. 38.
Vasoparalysis of Central Nervous System, Characteristic Vascular Syndrome: Significance in Pathology of Central Nervous System. I. M. Scheinker.—p. 43.
Synthesis of Hippuric Acid in Dementia Precox. S. T. Michael, J. M. Looney and E. J. Borkovic.—p. 57.
Abolition of Bulbocapnine Cataplexy in Cat by AC-Tetrahydro-B-Naphthylamine. E. F. Kerman.—p. 61.
Histamine Content of Blood During Insulin Shock Therapy. O. Billig and F. H. Hesser.—p. 65.

Archives of Otolaryngology, Chicago

40:1-74 (July) 1944

- Intracranial Suppuration Secondary to Disease of Nasal Septum: Survey of Literature; Report of Cases and Animal Experiments. L. K. Rosenqvist.—p. 1.
Chemotherapy and Biotherapy: Their Relation to Prevention and Treatment of Diseases of Ear, Nose and Throat. J. A. Kolmer.—p. 17.
Modern View of Neuralgia Referable to Meckel's Ganglion: Report of Cases Showing Relief of Pain and Sometimes Arrest of Development of Ulcers of Cornea by Cocainization of Ganglion. B. R. Dysart.—p. 29.
Thrombosis of Cavernous Sinus with Hemolytic Streptococcal Bacteremia: Treatment by Intravenous Injection of Sulfadiazine and Penicillin with Recovery. J. W. Wolf.—p. 33.
*Present Status of Diagnosis and Management of Ménière's Syndrome. H. Brunner.—p. 38.
Absorptive Capacity of Nose. M. Saltzman.—p. 44.
Cancer of Trachea: Report of 5 Cases. G. E. Fisher.—p. 49.
Prevention of Traumatic Deafness: Further Studies. W. H. Wilson.—p. 52.
Modification of Blade of LaForte Tonsillectome. F. E. Keller.—p. 59.

Ménière's Syndrome.—According to recent studies, Ménière's syndrome is due to an acute increase of fluid within the internal ear, particularly within the endolymphatic canal of the inferior part of the internal ear. These changes are called "hydrolabyrinth" to emphasize the similarity to hydrocephalus. The symptoms of Ménière's syndrome are due to acute hydrolabyrinth, which may resolve without injury to the internal ear or may lead to fixed dilatation of the inferior part of the internal ear and gradual or acute destruction of the sensorial cells. The typical Ménière attack consists of tinnitus, diminution of hearing, labyrinthine vertigo and spontaneous nystagmus. Only vertigo of the type which can be produced by the usual clinical methods of examining the labyrinth should be considered as labyrinthine. Spontaneous nystagmus between Ménière attacks is not of labyrinthine origin; it indicates an organic disease in the posterior cranial fossa. If the attacks consist only of labyrinthine or only of cochlear symptoms, a definite diagnosis cannot be made. If there is a systemic, cerebral or aural cause the symptom complex is

called "symptomatic Ménière's syndrome." When no etiologic factor can be determined, the disease is designated "idiopathic Ménière's syndrome." The pathologic changes are apparently the same in the two cases. The metabolic theory of the causation of the disease is not supported by microscopic observation, by chemical examination of the blood or by treatment. The vascular theory is supported by microscopic observation of the human ear as well as by experiment and explains the pathologic picture of the idiopathic as well as the symptomatic Ménière's syndrome. Most frequently the angioneurotic disturbances within the internal ear are due to arteriosclerosis of the brain. Various types of leukemia, syphilis, influenza, malaria, virus infection and particularly focal infection may cause the symptomatic Ménière's syndrome. Allergy is occasionally but not frequently a cause. A chronic adhesive process of the tympanic cavity frequently causes symptomatic Ménière's syndrome. When Ménière's syndrome is symptomatic, the etiologic disease should be treated. Treatment of the idiopathic type of Ménière's disease is difficult. Atkinson has recommended nicotinic acid on the ground that it is a vasodilator. The author employs symptomatic treatment, which is not always successful. Surgical treatment is justified only if the diagnosis of Ménière's syndrome is certain, if conservative measures have been exhausted and if the disease is progressive on one side while the other ear is normal.

Archives of Pathology, Chicago

38:1-62 (July) 1944

- *Infantile Toxoplasmosis; with Report of 3 New Cases, Including 2 in which Patients Were Identical Twins. W. W. Zuelzer.—p. 1.
- Parathyroiditis: Syndrome: Pituitary Dysfunction and "Primary" Hyperparathyroidism. R. M. Perlman.—p. 20.
- Protein as Oxidase. M. H. Fischer and W. J. Suer.—p. 28.
- Morphologic and Histochemical Study of Effect of Scurvy on Tuberculosis in Guinea Pigs and of Origin, Amount and Distribution of Alkaline Phosphatase in Foci of Caseous Necrosis. W. O. Russell, J. A. Read and E. T. Rouse.—p. 31.
- Histochemical Study of Effect of Scurvy on Activity of Alkaline Phosphatase in Kidneys of Guinea Pigs. W. O. Russell, E. T. Rouse and J. A. Read.—p. 40.
- Spontaneous Arteriosclerosis in Chickens. D. V. Dauber.—p. 46.
- Incidence of Mammary Carcinoma in Mice Treated with Estrogen: Effect of Age at Which Treatment with Estrogen Begins. L. Loeb, V. Sontzeff, E. L. Burns and I. R. Schenken.—p. 52.

Infantile Toxoplasmosis.—The number of reported cases of human toxoplasmosis, according to Zuelzer, totals 32. He reports 3 new cases. The first patient was a white boy who died on the third day of hospitalization when 11 days old. The second patient was a Negro infant, 1 of identical twin boys, who died when 1 month old. Complete necropsy reports are given of these 2 patients. The third patient, the identical twin brother of the second patient, is alive and has been under observation from birth to the present age of 7 months. Although in infants toxoplasmosis has a predilection for the central nervous system, the infection passes through a generalized stage in which many organs may be involved. The relative effect of toxoplasmosis on the central nervous system is magnified in later stages by the permanent character of the residual lesions, owing to the inability of nerve cells to regenerate, while lesions in other organs may heal with little or no residue. The disease may produce variable combinations of clinical and pathologic abnormalities. The parasites of toxoplasmosis invade tissue cells, in which they multiply, causing gradual loss of the characteristic cell structure and producing the appearance of cysts. The intracellular aggregate of toxoplasmas does not seem to produce a reaction in the tissue as long as the membrane of the host cell remains intact. Single parasites set free by rupture of a host cell or on their way from vessels to cells produce an inflammatory response. An equilibrium between host tissues and parasites may be established, leading to persistence of intact intracellular aggregates of toxoplasmas in normal tissues. The demonstration of the disease in twins, together with the presence of neutralizing antibodies in the maternal serum and the chronic character of most of the lesions observed in the twin who died of the disease at the age of 1 month, constitutes new evidence for the occurrence of prenatal infections with toxoplasma. One patient dying at the age of 11 days had an acute generalized toxoplasmic infection. Lesions were found in many organs,

among these the testicles, the pancreas and the kidneys, in which the infection has not been reported until now. The renal lesion consisted of focal glomerulonephritis. Generally the changes resembled those in acute toxoplasmosis of adults. The absence of demonstrable antibodies in the maternal serum indicates that the infection in this infant was acquired after birth and suggests that even early infantile toxoplasmosis is not always necessarily congenital. The clinical onset of the disease in the first few weeks of life is not in itself adequate proof of its prenatal inception. In the twins icterus accompanied the toxoplasmic infection. Icterus does not seem to be a common feature of the disease. Among 21 previously reported cases this symptom was present in only 3 instances. Analysis of the character of the icterus in the twins and of the underlying changes in the liver in the one who died does not support a causal relation to the toxoplasmic infection. Hepatosplenomegaly and extramedullary hemopoiesis in the spleen, the liver and other organs are genuine manifestations of toxoplasmosis of newborn and young infants.

Arkansas Medical Society Journal, Fort Smith

41:43-58 (July) 1944

- Tuberculosis Control in Arkansas. A. C. Curtis.—p. 43.

41:59-78 (Aug.) 1944

- Continuous Caudal Analgesia in Obstetrics. I. Fulton Jones.—p. 59.
- Suggested Health Program for Schools for Blind. F. W. Harris.—p. 62.

Bulletin of Los Angeles Neurological Society

9:1-120 (March-June) 1944

- Some Notes on History of Injury to Skull and Brain. C. B. Courville.—p. 1.
- Structural Basis for Common Traumatic Cerebral Syndromes. C. B. Courville.—p. 17.
- Disturbances of Cerebral Physiology Following Certain Types of Cranio-cerebral Injuries. R. B. Raney and A. A. Raney.—p. 28.
- Electroencephalographic Changes Due to Cerebral Trauma. C. Marsh.—p. 38.
- Concussion of Brain: Clinical and Experimental Observations. C. W. Olsen.—p. 46.
- Aphasia Due to Cerebral Trauma. J. M. Nielsen.—p. 52.
- Head Injuries in Relation to Psychoneurotic Symptoms and Personality Changes. S. D. Ingham.—p. 61.
- Psychiatric Syndromes Due to Head Injury: Observations on 174 Cases from Los Angeles County Psychopathic Hospital. G. N. Thompson and J. E. McGinnis.—p. 65.
- Interval Syndrome, with Some Comments on Its Causal Traumatic Lesions. R. S. Knighton.—p. 72.
- Post-Traumatic Epilepsy: Some Observations as to Its Pathogenesis and Treatment. C. Marsh.—p. 79.
- Traumatic Abscess of Brain: Survey of Recent Literature and Report of 9 Cases. H. M. Cunco.—p. 87.
- Subdural Neomembrane Following Head Injury: Report of 2 Cases. W. T. Grant.—p. 94.
- Surgical Experiences with War Wounds of Skull and Brain: Relating Surgical Experiences of Operating Team No. 578 and Subsequent Reflections. C. W. Rand.—p. 101.
- Penetrating Wounds of Skull: Some Therapeutic Considerations. G. H. Patterson.—p. 106.
- *Repair of Traumatic Cranial Defects: Some Experiences with Tantalum. D. L. Reeves.—p. 112.

Tantalum in Repair of Traumatic Cranial Defects.

Reeves states that, until the more recent use of vitallium and tantalum, materials other than autogenic bone grafts for the repair of cranial defects had been generally discredited. Tantalum is a bluish white metal, which has proved a satisfactory alloplastic material for the repair of peripheral nerves and cranial defects. The tantalum plates retain their original luster and show no signs of corrosion. No inflammatory reaction leading to extrusion or necessitating removal of the plates occurs. Because of its malleability the flat tantalum sheet can be cut to fit the defect with tin shears or heavy surgical scissors and then hammered or bent to the desired contour. By means of preoperative impressions, molds and models the tantalum sheet can be contoured accurately to fit the cranial defect and still be adjusted at the operating table. The accurately fitted plate is fastened to the bone with tantalum wire through perforations made along the edge of the plate. In the past year tantalum wire and foil have been used increasingly in the repair of peripheral nerves and the plates for the closure of large and difficult defects with very satisfactory results. The author describes 2 cases which illustrate the value of tantalum in the repair of cranial defects.

Cancer Research, Baltimore

4:465-528 (Aug.) 1944. Partial Index

- Fluorescence Studies on Cancer. F. H. J. Figge.—p. 465.
Oxidative Response of Normal and Neoplastic Tissues to Succinate and to p-Phenylenediamine. O. Rosenthal and D. L. Drabkin.—p. 487.
Action of Heptanal Sodium Bisulfite Methylsalicylate and of 2,4,6-Trimethylpyridine on Tissue Cultures of Human and Mouse Carcinoma and Rat Lymphosarcoma. Gladys Cameron, C. J. Kensler and R. Chambers.—p. 495.
Retarding Effect of Glyceraldehyde on Benzpyrene Sarcoma Formation in Mice. J. F. Riley and F. Pettigrew.—p. 502.
Multiple Primary Tumors in Dogs. R. M. Mulligan.—p. 505.
Antifibromatogenic Effects Produced by Intermittent Action of Progesterone. R. Iglesias, A. Lipschütz and G. Nieto.—p. 510.
Inactivation of Antifibromatogenic Substances (Progesterone and Desoxycorticosterone Acetate) in Liver. Christiane Dosne.—p. 512.
Experimental Study of Lateral Spread of Epidermoid (Squamous Cells) Carcinoma in Man and Reaction of Such Lesion to Wound Healing Stimulus. A. Brunschwig and T. F. Thornton Jr.—p. 515.

Endocrinology, Springfield, Ill.

35:73-138 (Aug.) 1944

- Biochemical Effects of Sex Hormones. Acid and Alkaline Phosphatase Activity, Calcium and Phosphorus. K. W. Buchwald and Leona Wyden.—p. 73.
Effect of Some Androgenic Steroids on Adrenal Cortex of Hypophysectomized Rats. S. L. Leonard.—p. 83.
Effect of Pure Adrenocorticotrophic Hormone on Work Performance of Hypophysectomized Rats. D. J. Ingle, C. H. Li and H. M. Evans.—p. 91.
Sensitivity of Reproductive System of Hypophysectomized 40 Day Male Rats to Gonadotropic Substances. Miriam E. Simpson, C. H. Li and H. M. Evans.—p. 96.
Water Intoxication in Relation to Thyroid and Adrenal Function. R. Gamst, Margaret Cordsen and Mildred Lilling.—p. 105.
Role of Hypophysis and Adrenals in Control of Systolic Blood Pressure in Rat. J. H. Leatham and V. A. Drill.—p. 112.
Metabolism of Steroid Hormones. Adrenal Cortical-like Material in Human Urine. R. I. Dorfman, B. N. Horwitt and R. A. Shipley.—p. 121.

Gastroenterology, Baltimore

3:1-72 (July) 1944

- *Heartburn. W. C. Alvarez.—p. 1.
Gastric Diverticulum: Gastroscopic Observation of 2 Cases. F. Whitehouse and J. M. MacMillan.—p. 13.
Cholecystography with Beta (4-Hydroxy-3,5-Diiodophenyl) Alpha Phenyl Propionic Acid. H. C. Ochsner.—p. 23.
Strangulation of Small Intestine Due to Prolapse Through Aperture in Great Omentum. S. Sanes and A. V. Postoloff.—p. 30.
Pyogenic Hepatitis with Staphylococcal Bacteremia Treated with Penicillin. A. A. Gonzalez and C. L. Vejar.—p. 33.
Gastric Excretion of Sulfadiazine in Man: Observations on Normals, Patients with Peptic Ulcer, Atrophic Gastritis and Gastric Cancer. N. Shapiro, H. S. Bloch and L. Schiff, with technical assistance of Lucy J. Crosley.—p. 39.
Effect of Detergent on Proteolytic Activity of Trypsin. C. L. Block, S. A. Portis and H. Necheles.—p. 45.

Heartburn.—Alvarez summarizes the results of questioning 123 persons with heartburn. The sensation consists of a burning and sometimes painful or rending distress, which begins usually under the lower end of the sternum and sometimes runs up as far as the pharynx. It tends to come in spells, and there are many curious and inexplicable features about its comings and goings. It does not appear to be due to any known organic disease of the digestive tract. At least 17 of the patients had or had had ulcer, but, curiously, when the ulcer was active and they had hunger pain they were free from heartburn. The symptom, therefore, did not seem to be produced by the ulcer. Heredity is sometimes a factor. Seventy-three per cent of the patients were men. Many of the patients suffered with regurgitation and belching, and these symptoms were occasionally associated with the heartburn, apparently only when the esophageal mucosa had been sensitized. When the esophagus was normal, regurgitation of acid gastric contents did not cause burning. Immediate causes of heartburn are eating too fast or too much or eating certain foods such as fats, coffee, onions, seasonings, radishes, tomato, orange, egg, cucumber, chocolate, peppers and cabbage. Alcohol and tobacco can be important factors, as can be emotion. Lying down or bending or exercising may bring on heartburn. The degree of acidity of the gastric contents is apparently not important, and heartburn can trouble persons with achlorhydria even to histamine. Three of the patients studied had cancer of the stomach. Sodium bicarbonate commonly gives relief, partly through neutralizing acid in the

esophagus and the stomach and partly by causing waves of reverse peristalsis to run out and stop coming. The evidence obtained in this study fits with that obtained by experimenters and suggests that heartburn is due largely to regurgitation into a sensitized esophagus and partly to reverse waves of peristalsis coming up from the stomach.

Indiana State Medical Assn. Journal, Indianapolis

37:387-426 (Aug.) 1944

- Retrocecal Appendix. W. C. Reed and U. F. D. Stork.—p. 387.
Psychosomatic Medicine. J. V. Reed.—p. 391.
Industrial Medicine in Action. E. S. Jones.—p. 397.
New Technic in Drawing Blood for Serodiagnostic Tests (Use of Hemospast). K. E. Markson.—p. 400.
Primary Closure of Pilonidal Cysts and Sinuses. M. Cornacchione.—p. 402.
Eye Trauma in Amphibious Troop Operations of U. S. S. Solace. A. F. Clements.—p. 404.

Journal of Allergy, St. Louis

15:245-310 (July) 1944

- Immunity Against H-Substance. M. B. Cohen and H. J. Friedman.—p. 245.
*Deaths from Asthma. F. M. Rackemann.—p. 249.
*Value of Patch Test in Poison Ivy Dermatitis, with Consideration of Group Reactions Between Rhus Extract and Turpentine, Pyrethrum, Ragweed Oil and 3-Geranyl Catechol. H. Keil.—p. 259.
*Penicillin Allergy: Probability of Allergic Reactions in Fungus Sensitive Individuals; Preliminary Experience. S. M. Feinberg.—p. 271.
Immunologic Management of Patient with Allergy. M. B. Cohen.—p. 274.
Significance of Allergy in Military Medicine: Report of Incidence of Allergic Diseases in Large Station Hospital, and Method of Pre-induction Evaluation of Allergic State. E. M. Gold and J. M. Bazemore.—p. 279.

Deaths from Asthma.—Rackemann reviews the records of 82 patients who died because of asthma. Most of these deaths occurred in persons whose asthma began after the age of 45, although typical symptoms and pathologic manifestations can also occur in younger persons. Death from asthma is caused by the development of plugs of tough, sticky mucus which obstruct the bronchi and lead to suffocation. The pathologic picture is typical: it is characterized by voluminous, distended lungs of bluish gray, the cut section of which shows all the bronchi, especially those of medium and small size, occluded by plugs. The author presents one chart which shows in graphic form the mode of death and the pathologic changes in 50 of the author's patients who died with asthma as the presenting symptom. Of these, 27 presented pathologic features which he regards as typical of asthma. Another chart shows 55 cases found in the literature which meet the requirements, namely (a) a clinical history and a mode of death characteristic of asthma, (b) a necropsy showing voluminous lungs and bronchial plugs and (c) a necropsy showing no gross evidence of other causes of death.

Patch Tests in Poison Ivy Dermatitis.—Keil studied 72 cases, of which 40 were probable instances of dermatitis due to poison ivy, 26 of dermatitis venenata of various other causes, mainly plants, and 6 of doubtful instances of poison ivy. With the exception of the second subgroup, all of the patients showed positive reactions to an extract of poison ivy. The cases were carefully selected, so that the incidence of 64 per cent positive reactions to rhus extract was probably higher than the figures for normal subjects. These studies support the generally accepted opinions on the uses and limitations of the patch test in relation to poison ivy dermatitis: a positive patch test with a potent rhus extract does not prove the presence of dermatitis due to poison ivy but simply indicates sensitization to the plant. The diagnostic value of the test is depreciated by the high incidence of positive reactions in the normal adult population. A negative patch test eliminates past and present hypersensitivity to Rhus toxicodendron; on this point rests the chief value of the test in differential diagnosis of dermatitis due to poison ivy. The quantitative patch test is an important method of checking the value of treatment in this disease. A positive patch test does not necessarily mean that the patient has had clinical dermatitis from poison ivy or will acquire it under ordinary conditions of exposure. The relation between the results obtained with the patch test and the acquisition of clinical disease depends probably on quantitative factors involving the

degree of hypersensitiveness and the severity of exposure. Those showing positive patch tests are more apt to acquire a dermatitis from contact with rhus than those with negative patch tests. The value of the test in experimental studies cannot be overstressed. There is no apparent biologic relation between hypersensitiveness to poison ivy and that to fresh turpentine of various types or to alpha and beta pinene. Group reactions may be encountered with old specimens of turpentine, probably because of an increase in the phenolic fraction of turpentine. Evidence of a group relation between the active ingredient in poison ivy and pyrethrum or ragweed oil was not found. Evidence is presented to show, in substantiation of the work of Landsteiner and Jacobs in guinea pigs, that, in man, 3-geranyl catechol is biologically related to the active principle in poison ivy. Hypersensitiveness to 3-geranyl catechol seems to be dependent on the unsaturated geranyl group in combination with the catechol configuration.

Penicillin Allergy.—Feinberg points out that reactions to penicillin, mainly in the form of urticaria, have appeared in 5.7 per cent of patients receiving the substance. The reactions did not resemble the classic and severe allergic reactions which would be likely to follow the injection of an allergen to which the person had been naturally sensitive. Ten patients who were clinically mold sensitive and who gave positive reactions with extracts of various *Penicillia* were given skin tests with two batches of penicillin. Reactions were negative in all cases. Apparently *Penicillium* sensitive persons are safe from allergic reactions to penicillin. The possibility of allergic reactions cannot be totally ignored in view of the fact that the original source of penicillin is a potent antigen and that at times some of the antigen may be a final contaminant. It is suggested that as an added safeguard every batch of commercial penicillin be tested on known *Penicillium* sensitive persons. The author tested a more recently prepared penicillin of higher potency. This preparation could be tolerated by an average *Penicillium* sensitive patient in doses of at least 500,000 units.

Journal of Bone and Joint Surgery, Boston

26:435-620 (July) 1944. Partial Index

- Basic Problems in Bone Grafting for Ununited Compound Fractures. C. R. Murray.—p. 437.
Wound Healing in Compound Fractures and Repair of Bone Defects. K. F. Mech.—p. 442.
Surface Repair of Compound Injuries. J. B. Brown.—p. 448.
Bridging of Bone Defects in Compound Wounds. J. R. Moore.—p. 455.
End Results of Treatment of Fresh Fractures by Use of Stader Apparatus. C. M. Shaar, F. P. Kreuz Jr. and D. T. Jones.—p. 471.
Use of Haynes Skeletal Fixation Apparatus in Definitive Orthopedic Surgery. R. W. Johnson Jr. and J. Lyford III.—p. 475.
Use of Untubed Pedicle Grafts in Repair of Deep Defects of Foot and Ankle: Technic and Results. R. K. Ghormley and P. R. Lipscomb.—p. 483.
*Immediate Application of Free Full Thickness Skin Graft for Traumatic Amputation of Finger. H. R. McCarroll.—p. 489.
Injuries to Ligaments of Knee Joint. L. C. Abbott, J. B. de C. M. Saunders, F. C. Bost and C. E. Anderson.—p. 503.
Role of Penicillin in Management of Infection. J. M. Ferrer Jr.—p. 522.
Surgical Treatment of Hallux Valgus in Troops in Training at Fort Jackson During Year of 1942. M. Cleveland, L. J. Willien and P. C. Doran.—p. 531.
Principles of Amputations of Fingers and Hand. D. B. Slocum and D. R. Pratt.—p. 535.
Fatigue Fractures. P. A. Robin and S. B. Thompson.—p. 557.
*Bone Drilling in Delayed Union of Fractures. M. E. Pusitz and E. V. Davis.—p. 560.
Fractures of Os Calcis: Tripod-Pin-Traction Apparatus. E. D. McBride.—p. 578.
Posterior Approach to Shoulder Joint. C. R. Rowe and L. B. K. Yee.—p. 580.
Subtalar Dislocation. L. W. Plewes and K. G. McKelvey.—p. 585.
Acute Acromioclavicular Dislocation: Simple Effective Method of Conservative Treatment. I. Wolin.—p. 589.

Immediate Free Full Thickness Skin Graft for Traumatic Amputation of Finger.—McCarroll shows that the use of punch presses, trim machines, loading machines and numerous other automatic mechanical units by personnel often new and inexperienced in their operation is the factor responsible for the increasing role which traumatic amputation of fingers now plays in the field of traumatic surgery. Most of these injuries occur in the distal phalanx and result in a guillotine type of amputation, including all the soft tissue pad at the finger tip,

a part or all of the nail and part of the bone. The amputation in all cases in this series of 45 cases occurred through the distal phalanx. These patients were treated by immediate application of a free full thickness graft. Of these 45 cases, 43 have shown complete takes of the grafts. Each presented a smooth, well rounded finger tip, soft, nonadherent, nonsensitive and satisfactory in appearance; all the patients have been able to return to their former occupation. They have been able to work during the period of postoperative care, since only the involved finger was incorporated in a dressing. The remaining 2 cases are classified as failures with loss of the graft, although in neither instance was the graft a hundred per cent loss. Each retained enough of the graft to aid in filling in the defect and in decreasing the period of disability, although there was an increased amount of scarring over the finger tip, which was adherent to the underlying structures. Immediate application of free full thickness skin grafts should be considered as the procedure of first choice in the management of traumatic amputation of the finger.

Bone Drilling in Delayed Union of Fractures.—Pusitz and Davis say that bone drilling is not a method of choice in the treatment of definite nonunion; it is intended for the treatment of delayed union. Differentiation between delayed and nonunion involves time and roentgenographic studies. A delayed union may be still present at the end of ten months, whereas nonunion may be present at the end of ten weeks. There are three essential types of nonunion: (1) typical pseudarthrosis with sclerosis of the ends of the fragments, (2) fibrous union with osteoporosis of the fragments and (3) fibrous union with atrophy of disuse. In delayed union, although there may be no discernible callus, there is no sclerosis of the ends of the fragments. If there is absolutely no evidence of callus formation at the end of four to six months, delayed union may be considered to be present. A large number, probably the majority, of delayed unions will ultimately unite. This may take eight months or eighteen months, and a proportion of these delayed unions will resolve themselves into nonunions. Delayed union is the primary indication for bone drilling. It should be performed within a four to six months period. The dissection should be minimal. A series of thirty to fifty holes are drilled. After the bone has been properly drilled, simple closure is effected. The part is then properly immobilized, as after a fresh fracture. A well fitting, nonpadded plaster of paris cast is applied, to which a walking caliper is added after a week or ten days. The authors review 25 consecutive cases in which bone drilling was done. All cases except 1 showed bony union both clinically and roentgenographically. The average duration for the development of union after drilling was eight weeks. The shortest period was three weeks, and the longest was five months. The patients were up and around in a walking cast a week or ten days after operation. There were no postoperative infections.

Journal of Clinical Investigation, Boston

23:289-416 (May) 1944. Partial Index

- Level of Vitamin A and Carotene in Plasma of Rheumatic Subjects. R. E. Shank, A. F. Coburn, Lucille V. Moore and C. L. Hoagland.—p. 289.
Subclinical Vitamin Deficiency: IV. Plasma Thiamine. Mildred H. Carleen, N. Weissman and J. W. Ferrebee.—p. 297.
Characteristics of Normal Electroencephalogram: I. Study of Occipital Cortical Potentials in 500 Normal Adults. Mary A. B. Brazier and J. E. Finesinger.—p. 303.
Effects of Pleural Effusion on Respiration and Circulation in Man. M. D. Altschule and N. Zamcheck.—p. 325.
Influence of Collapsibility of Veins on Venous Pressure, Including New Procedure for Measuring Tissue Pressure. H. W. Ryder, W. E. Mollé and E. B. Ferris Jr.—p. 333.
*Preservation of Normal Human Plasma in Liquid State: I. Statistical Study of 1,751 Administrations. E. L. Lozner and L. R. Newhouser.—p. 343.
Effect of Single Injection of Concentrated Human Serum Albumin on Circulating Proteins and Proteinuria in Nephrosis. J. A. Luetscher Jr.—p. 365.
Skin Temperatures of Extremities of Persons with Induced Deficiencies of Thiamine, Riboflavin and Other Components of B Complex. Grace M. Roth, R. D. Williams and C. Sheard.—p. 373.
Renal Circulation in Shock. H. D. Lauson, S. E. Bradley and A. Courmand, with technical assistance of Vera Vessey Andrews.—p. 381.
Fate and Effects of Transfused Serum or Plasma in Normal Dogs. W. Metcalf.—p. 403.

Journal of Immunology, Baltimore

49:1-70 (July) 1944

- Studies on Plague Immunity in Experimental Animals: I. Protective and Antitoxic Antibodies in Serum of Actively Immunized Animals. E. Jawetz and K. F. Meyer.—p. 1.
Id.: II. Some Factors of Immunity Mechanism in Bubonic Plague. E. Jawetz and K. F. Meyer.—p. 15.
Immunological Studies on Human Serum: VI. Fixation of Components of Human Complement by Bacteria. T. F. Dozois, S. Seifter and E. E. Ecker.—p. 31.
Id.: V. Bactericidal Properties of Purified C'1 and C'2 of Human Complement. S. Seifter, T. F. Dozois and E. E. Ecker.—p. 45.
Diagrammatic Representation of Human Blood Group Reactions. A. S. Wiener and H. E. Karowe.—p. 51.
Complement Fixation Reaction with Antigen of Lymphogranuloma Venereum (Lymphogranuloma). J. E. Blair, with technical assistance of Frances A. Hallman.—p. 63.

Journal Neuropath. and Exper. Neurology, Baltimore

3:199-310 (July) 1944

- *Neurohistologic Findings in Experimental Electric Shock Treatment. N. W. Winkelman and M. T. Moore.—p. 199.
*Pathologic Characteristics of Embolic or Metastatic Encephalitis. B. J. Alpers and H. S. Gaskill.—p. 210.
Alterations in Brain Structure After Asphyxiation at Birth: Experimental Study in Guinea Pig. W. F. Windle, R. F. Becker and A. Weil.—p. 224.
Allergic Brain Changes in Postscarlatinal Encephalitis. A. Ferraro.—p. 239.
Multiple Meningioma and Meningiomas Associated with Other Brain Tumors. S. Arieti.—p. 255.
Subacute Necrotic Myelopathy: Fatal Myelopathy of Unknown Origin. C. Davison and S. Brock.—p. 271.
Reactions of Monkeys of Various Ages to Partial and Complete Decortication. Margaret A. Kennard.—p. 289.

Neurohistologic Findings in Experimental Electric Shock Treatment.—Winkelman and Moore subjected cats to electrocerebral shock, utilizing the faradic current of Berkwitz or the Cerletti-Dini type of house current. The experiments were conducted in close imitation to human electroshock therapy, and to 2 animals excessive doses were given intentionally. The nutritional aspects of the animals were carefully controlled. Microscopic studies of the brains and cords revealed no morphologic changes in animals receiving convulsive doses analogous to those given to human beings. In the 2 animals given excessive electric shock doses, one small area of pericapillary hemorrhage was seen in 1 and congestion of the smaller vasculature was observed in the other. In no case were subarachnoid hemorrhages or diffuse or extensive intracerebral hemorrhages encountered. While their studies indicate that permanent morphologic changes do not result from electrocerebral shock per se, they feel that intracellular biochemical changes do take place by virtue of the passage of the current and the resultant convulsion. These undemonstrable changes explain the clinical improvement in some patients. They gained the impression that in a large series of human cases in which a prolonged series of shocks was accompanied by a rise in blood pressure this was not attributable to cardiovascular-renal change but rather to changes within the autonomic nerve cells of the subthalamic nuclei.

Pathologic Aspects of Embolic or Metastatic Encephalitis.—Alpers and Gaskill, in their studies of 17 cases of embolic encephalitis, found that the heart valves are most frequently the source of metastatic encephalitis, particularly in cases of subacute bacterial endocarditis. Acute endocarditis of other types, pulmonary disease and foci involving other organs may give rise to this form of encephalitis. Clinical manifestations indicating brain involvement, particularly in endocarditis, may usher in the disease; they may be terminal or may occur anywhere along its course. The brain may contain few or numerous areas of encephalitis. These may be found anywhere in the cerebral hemispheres, brain stem or basal ganglia. Microscopically, brains so afflicted show a proliferative endarteritis which tends to be quite generalized, areas of perivascular infiltration with leukocytes, minute leukocytic nodules which are essentially milium abscesses and in some instances areas of petechial and perivascular hemorrhage. Subarachnoid, cerebral or ventricular hemorrhage may be found as well as meningitis. The foci of metastatic encephalitis are probably blood borne and are probably carried by means of the system of paravertebral veins described by Batson.

Journal of Urology, Baltimore

52:1-98 (July) 1944

- Physiologic Concepts Conveyed by Word for Kidneys Among Various Peoples. D. I. Macht.—p. 1.
Report of Case of Perirenal Hemorrhage from Spontaneous Rupture of an Intrarenal Artery. W. P. Longmire Jr.—p. 12.
Perirenal Abscess with Extension into Right Pleural Cavity Following Rupture of Right Renal Pelvis: Operative Findings and Results. N. S. Moore and H. H. McCarthy.—p. 17.
Gumma of Bladder: Report of Case. J. K. Ormond and J. G. Hemminger Jr.—p. 23.
Operation for Cure of Stress Incontinence in Female. F. Macky.—p. 27.
Management of Traumatic Rupture of Urethra and Bladder Complicating Fracture of Pelvis. E. J. McCague and J. H. Semans.—p. 36.
Reconstruction of Membranous Urethra: Case Reports. C. A. W. Uhle and H. R. Erb.—p. 42.
Management of Urethrorrectal Fistula: Review of Literature and Report of Spontaneous Closure. B. C. Corbus Jr. and B. C. Corbus Sr.—p. 61.
Sarcoma of Penis. B. Levant.—p. 63.
True Hermaphroditism: Report of 2 Cases. R. B. McIver, D. R. Seabough and M. Mangels Jr.—p. 67.
Keratinomatous Cysts of Scrotum: Case Report. A. A. Roth.—p. 86.
Nanthine Calculus: Case Report. A. J. Butt and H. D. Holliman Jr.—p. 89.
Nonspecific Urethritis of Venereal Origin. P. Grenley.—p. 92.

Minnesota Medicine, St. Paul

27:513-592 (July) 1944

- New Intensive Measures for Treatment of Early Syphilis. P. A. O'Leary.—p. 535.
Preoperative and Postoperative Care for Bad Risk Patient. C. Dennis.—p. 538.
Early Diagnosis of Tuberculosis. B. J. Terrell.—p. 543.
Postmortem Examinations. H. E. Robertson.—p. 548.
Isolation from Milk Supplies of Specific Types of Green Producing (Alpha) Streptococci and Their Thermal Death Point in Milk. E. C. Rosenow.—p. 550.

27:593-680 (Aug.) 1944

- Certain Obligations of Physician. E. M. Jones.—p. 617.
Malignant Carcinoid Tumors of Small Intestine: Report of 2 Cases. J. E. Blumgren.—p. 620.
Providing for Nutritional Needs of Older Patients in General Hospitals. E. L. Tuohy.—p. 623.
Relationship of Descensus Uteri to Pelvic Size and Morphology and to Certain Obstetric and Economic Factors. A. L. Dippel.—p. 627.
Oriental Diseases. G. J. Guldseth.—p. 631.
War and Pestilence. C. B. Drake.—p. 634.
Failure of Surgical Wound Healing Due to Talc. A. H. Wells.—p. 640.

New Jersey Medical Society Journal, Trenton

41:263-298 (July) 1944

- Postwar Planning. L. H. Bauer.—p. 270.
Postwar Medical Education. R. C. Buerki.—p. 277.
Newer Aspects of Chemotherapy. B. W. Carey.—p. 279.

41:299-328 (Aug.) 1944

- Planning for Medical Service in Postwar Period. J. E. Paullin.—p. 302.
Announcement to Doctors and Pharmacists of New Jersey. R. P. Fischel.—p. 305.
Can Voluntary Health Insurance Meet the Need? E. A. Van Steenwyk.—p. 306.
Some Aspects of Abortion Problem. H. P. Shipp.—p. 311.

Public Health Reports, Washington, D. C.

59:1009-1040 (Aug. 4) 1944

- *Histopathologic Changes Following Administration of DDT to Several Species of Animals. A. A. Nelson, J. H. Draize, G. Woodward, O. G. Fitzhugh, R. B. Smith Jr. and H. O. Calvery.—p. 1009.
Diamond Points and Discard Rate of Steel Dental Burs. H. Klein.—p. 1021.

Histopathologic Changes Following DDT Administration.—Nelson and his collaborators made microscopic studies on 117 animals of 9 different species after the administration of 1, 1, 1 trichloro-, 2, 2 diparaphenyl-ethane, an insecticide which is generally designated as DDT. The substance was administered by intubation, by stomach tube or by admixture in the diet and in doses varying from those fatal in a few days to those causing no perceptible lesions after several months. The animals included rabbits, rats, guinea pigs, mice, chicks, dogs, cows, sheep and a horse. Although there were wide variations in sensitivity to the compound among the different animals of a given species, the lesions caused were quite consistent throughout the different species. On the higher dosage levels, with the animals surviving for one to several weeks, there resulted a moderate degree of central necrosis of the liver or, with the

longer periods of survival, a combination of central necrosis and reparative hypertrophy which can be labeled as a moderate subacute degeneration of the liver. The thyroid often showed moderate colloid depletion, less often epithelial desquamation and rarely epithelial hyperplasia. Slight to moderate focal necrosis of voluntary muscles occurred in about 20 per cent of animals on the higher dosage levels. Rabbits showed certain lesions not seen in the other species, a focal necrosis of the gallbladder and an increased incidence of the "spontaneous" types of encephalitis and nephritis. Dermatitis in inoculated animals was mild throughout, except that rabbits on the highest doses showed slight focal necrosis of the epidermis. For a given dosage level of DDT, chickens and guinea pigs showed fewer microscopic lesions than did the other species. A special effort was made to determine nerve cell changes in the brain and spinal cord of animals with tremors. With routine fixation and staining (formaldehyde and Orth's; hematoxylin-eosin) no changes could be seen that were not present in controls similarly and concurrently fixed and stained. Rare myocardial and adrenal lesions may be of significance. DDT caused insignificant or no effects on bone marrow, bone, testis, pancreas and spleen. Renal lesions were slight and infrequent. Because of the tremors of long duration produced by it, DDT would appear to be a promising experimental agent for the neurophysiologist.

Southern Medical Journal, Birmingham, Ala.

37:415-470 (Aug.) 1944

- Indications for Pelviccopy in the Female. W. B. Harrell and R. Estevez.—p. 415.
Body Section Roentgenography. G. J. Baylin.—p. 418.
*Cerebral Glioma in Siblings. W. Riese, J. M. Meredith and I. S. Zfass.—p. 424.
*Myocardial Infarction in Congenital Dextrocardia. L. E. Geeslin and G. R. Tyler.—p. 428.
New Operation for Shortening Round Ligaments. N. A. Schneider.—p. 434.
Uterine Malformation: Case Report. J. M. Olds, W. A. Swanker and J. E. Josephson.—p. 436.
Diagnostic Aid in Perinephric Abscess: Sulfonamide Ineffectiveness. G. G. Gilbert and J. E. Dees.—p. 438.
*Cramp in Rectum: Significance, Differentiation and Treatment, with Case Reports. M. C. Pruitt.—p. 442.
Esophageal Manifestations of Pellagra. G. E. Fisher.—p. 446.
Hemolytic Anemia. M. F. Beard.—p. 448.
Treatment of Diabetic Coma. L. B. Owens.—p. 450.
Diabetic Coma. F. G. Speidel.—p. 454.
William Shakespeare, Therapist. W. E. Vest.—p. 457.

Cerebral Glioma in Siblings.—Riese and his associates state that the only "glioma" in which a familial tendency has been established is the glioma of the retina. Only occasionally has the familial occurrence of a true glioma been mentioned in the literature. They describe the clinical picture and the histopathologic type of 2 cases of cerebral glioma which occurred in 2 members of the same family (brother and sister). In both the growth developed in adult life, at the age of 39 in the sister and of 50 in the brother. In both cases the duration of the clinical history was two months. In the brother the tumor was a striothalamic growth; in the sister an involvement of similar regions was probable, although the tumor also involved the cortex. The histogenic type of the tumor was identical in the two instances; it was a glioblastoma multiforme. The sister also had a carcinoma of the left lung and uterine leiomyomas. The authors think that the fact that this woman did not develop a brain tumor of the same type of neoplasm which was present in the lung, but instead a primary glioma, is indicative of an intrinsic tendency to develop glioma. The authors do not think that pure coincidence would be satisfactory in explaining the occurrence of the identical type of brain neoplasm in siblings and suggest further investigations of the frequency of brain tumor in siblings and of the combination of primary brain tumor with primary tumors of other distant organs in the same person.

Myocardial Infarction in Congenital Dextrocardia.—Geeslin and Tyler present the history of an officer, aged 43, who complained of substernal "twisting" pain radiating into both shoulders and arms for the preceding four days. The presence of dextrocardia with situs inversus was established by physical examination, roentgenographic visualization of the transposed heart, stomach, liver and gallbladder and the mirror image inversion of lead 1 in the electrocardiograms in 1936 and 1943. Coronary occlusion was suspected from the history. The

changes in leads 1, 2 and 4 of the serial electrocardiograms were diagnostic of an anteroapical myocardial infarction. In congenital dextrocardia the conductive system of the heart is transposed as well as the chambers and, since the left arm is nearer the right auricle in contrast to the normally placed heart in which the right arm is closer to the right auricle, a total inversion of lead 1 and transposition of leads 2 and 3 is produced. The use of mirror image leads to study the "mirror image" heart is a logical procedure, and their use to study heart disease in the presence of dextrocardia has been reported previously. The use of the mirror image technic is particularly important for the precordial leads. To place the precordial electrode on the left chest when a dextrocardia is present must fail to elicit a fair proportion of the available cardiac current deflections and offer the confused possibility not only of deflection reversals but of change in contour shape.

Surgery, St. Louis

16:1-168 (July) 1944

- Symposium on Endocrinology of Neoplastic Diseases: Introduction. G. H. Twombly and G. T. Pack.—p. 1.
Tumors in Experimental Animals Receiving Steroid Hormones. W. U. Gardner.—p. 8.
Experimental Investigations Concerning Role of Pituitary in Tumorigenesis. H. Selye.—p. 33.
Endocrine Effects of Pituitary Tumors: Clinical Review. W. J. German.—p. 47.
Ovarian Tumors with Sex Hormone Function. E. Novak.—p. 82.
Endocrine Factors in Origin of Tumors of Uterus. H. C. Taylor.—p. 91.
Relationship of Hormones to Diseases of Breast. I. T. Nathanson.—p. 108.
Effect of Sex Hormones on Skeletal Metastases from Breast Cancer. J. H. Farrow.—p. 141.
Benign Hypertrophy and Carcinoma of Prostate: Occurrence and Experimental Production in Animals. R. A. Moore.—p. 152.

Union Médicale du Canada, Montreal

73:873-1002 (Aug.) 1944

- Considerations of Cancer of Colon. A. Juras.—p. 877.
*Allergic Purpura Simulating "Surgical Abdomen": Henoch's Purpura. C. Bisson and P. David.—p. 881.
Embolism of Lower Extremities. R. Amyot and J. Vasquez.—p. 885.
Cyst of the Thyroglossal Duct Simulating a Laryngocele. V. Latraverse.—p. 890.
Suffocating Influenzal Laryngitis in Infant of 5 Weeks. N. Vezina.—p. 894.
Masked Syphilis: Study of Several Cases. H. Smith.—p. 898.
Tumors of Interstitial Cells of Testes. J. L. Riopelle.—p. 903.
Mode of Action of Vitamins. A. Gagnon.—p. 906.

Purpura of Henoch Simulating "Surgical Abdomen."—Bisson and David report the history of a child, aged 11, who fifteen days previously had had profuse sanguinolent vomiting. Sippy treatment was given for a week, but when at the end of this period a boiled egg was given another attack of sanguinolent vomiting occurred. At this time it was noted that the patient had petechiae on his feet, arms and buttocks. There was excruciating pain in the epigastric region. The child was stuporous, its temperature was 99.4 F. and the pulse rate was 88. The stupor and vomiting persisted and the stools became increasingly bloody. On the sixth day the child became doubled up with abdominal pain, refused all food and vomited repeatedly; the purpuric spots reappeared in large numbers on the extremities and the abdomen. An abdominal surgical emergency was thought of such as a typhic perforation, a Meckel diverticulum, intestinal invagination, acute pancreatitis or rupture of the appendix. On the following day the child suddenly was much improved and was free from abdominal pain, but the cutaneous spots persisted. The purpura was unusual because platelets and the bleeding time were normal. Schönlein's or rheumatic purpura is characterized by the predominance of articular symptoms, while Henoch's purpura is characterized by abdominal symptoms. Henoch's purpura should be defined as an allergic purpura with abdominal symptoms. In 95 per cent of cases of Henoch's purpura useless surgical interventions such as appendectomy, gastrectomy or cholecystectomy have been done. The treatment of Henoch's purpura is still largely empirical. It includes epinephrine to counteract the abdominal pain; vitamin P to regulate the permeability of the vessels and search for alimentary allergy and desensitization. This patient was found to be sensitive to crab meat and lima beans.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

17:165-196 (June) 1944

- Diagnosis and Treatment of Lung Abscess: Symposium. T. H. Sellors. L. G. Blair and L. E. Houghton.—p. 165.
Energy Absorption: Part II. Integral Dose When Whole Body Is Irradiated. W. V. Mayneord and J. R. Clarkson.—p. 177.
Case of Peptic Ulcer on Greater Curvature of Stomach. A. Preiss.—p. 182.
Cancer of Lip. S. J. Douglas.—p. 185.
Geometrical Method of Dose Finding for Radium Sources, with Special Reference to Treatment of Carcinoma of Cervix Uteri. B. Sandler and E. M. Ungar.—p. 190.

British Medical Journal, London

2:1-34 (July 1) 1944

- *Penicillin in Battle Casualties. J. S. Jeffrey and S. Thomson.—p. 1.
Early Diagnosis of Peripheral Nerve Injuries in Battle Casualties. W. R. Russell and A. B. Harrington.—p. 4.
Acute Hemolytic Anemia: Report of Case Presenting Hitherto Unreported Features. J. P. Currie.—p. 8.
Typhus Fever in Great Britain. A. P. Agnew and W. B. Kyles.—p. 10.
Tetanus After Head Injury in Immunized Subject. W. Lewin.—p. 11.

2:35-66 (July 8) 1944

- Clinical View of Shock. V. Z. Cope.—p. 35.
Thoughts on Four Years of War Surgery—1939 to 1943. P. H. Mitchiner.—p. 37.
Neuropsychiatry at Royal Air Force Center: Analysis of 2,000 Cases. S. I. Ballard and H. G. Miller.—p. 40.
Spontaneous Renal Apoplexy with Resuscitation After Cardiac Arrest. S. L. Governale and A. G. Rink.—p. 43.
Gonorrhea in North Africa and Central Mediterranean. D. J. Campbell.—p. 44.

Penicillin in Battle Casualties.—Jeffrey and Thomson state that the War Office formed in September 1943 a "Penicillin Control Unit." Supplies of penicillin were flown to Italy regularly. The drug was distributed among eighty operating centers. The calcium penicillin was mixed with sulfathiazole in the strength of 5,000 units of penicillin per gram of sulfathiazole. This made a satisfactory powder, which, along with an efficient insufflator, was distributed among the forward operating centers. Most of the sodium salt was sent to base hospitals to give adequate courses of penicillin systemically. The forward units were given small stocks of sodium penicillin for use in gas gangrene and penetrating chest wounds. The transfusion officer and his orderlies were entrusted with the systemic administration; 15,000 units in 3 cc. doses was injected at three hour intervals. Occasionally the administration was by continuous intravenous drip. The intramuscular route proved more satisfactory. The technic of penicillin administration in secondary suture became standardized (1) for superficial wounds, if clean—a single insufflation of penicillin-sulfathiazole powder and suture; (2) for dirty superficial wounds—preliminary insufflations once daily for two days, then suture over a third insufflation; (3) for sinuses, and perforating wounds where the powder could not reach—suture with fine rubber tubes and instillations of 3 cc. (250 units per cubic centimeter) down each tube daily for four days. In all three types practically no excision was done except to freshen the skin edge and remove a loose tag. The powder was at a strength of 5,000 units per gram but latterly equally good results were obtained at base hospitals using 2,000 units per gram. In empyema systemic treatment with penicillin is not enough. In severe fractures the course of penicillin extended over five to ten days (500,000 to 1,000,000 units): 15,000 units was given three hourly by intramuscular injection. Infected amputation stumps healed fairly well when treated by means of tubes and instillations, but better results were obtained with a systemic course of penicillin. Encouraging results were obtained in gas gangrene; in addition to radical surgery and gas gangrene antiserum, penicillin was given systemically. It was not felt that there was a special indication for penicillin in penetrating abdominal wounds, for it seemed that the deaths were due to physiologic reasons rather than to sepsis. Penicillin-sulfathiazole powder was insufflated into surface wounds and into the depths of the brain. In brain

abscesses tubes and instillations formed the method of choice. With the use of penicillin-sulfathiazole powder many face wounds have had primary suture. Satisfactory results were obtained in cases of corneal ulcers and abrasions and conjunctivitis by two hourly drops of sodium penicillin, 1,000 units per cubic centimeter of distilled water. Penicillin-sulfathiazole powder insufflated on to the burned area and covered with tulle gras proved an excellent dressing for burns.

Journal of Physiology Cambridge

103:1-136 (June 15) 1944

- Effect of Age on Dark Adaptation. G. W. Robertson and J. Yudkin.—p. 1.
Action of Vitamin D on Incisor Teeth of Rats Consuming Diets with High or Low Ca:P. Ratio. J. T. Irving.—p. 9.
Nature of Synaptic Transmission in Sympathetic Ganglion. J. C. Eccles.—p. 27.
Action of Adrenalin on Transmission in Superior Cervical Ganglion. Edith Bülbring.—p. 55.
Pressor Bases of Normal Urine. Mary F. Lockett.—p. 68.
Action of Acetylcholine, Atropine and Eserine on Central Nervous System of Decerebrate Cat. I. Calma and S. Wright.—p. 93.
Stimulus Intensity in Relation to Excitation and Preexcitatory and Postexcitatory Inhibition in Isolated Elements of Mammalian Retinae. R. Granit.—p. 103.
Role of Peripheral Stump in Control of Fiber Diameter in Regenerating Nerves. F. K. Sanders and J. Z. Young.—p. 119.

Lancet, London

2:33-64 (July 8) 1944

- Visual Problems of Aerial Warfare. P. C. Livingston.—p. 33.
Abdominal Wounds: Clinical Review of 65 Cases. H. G. Estcourt, J. A. Ross, S. I. C. Clarke and R. W. Ross.—p. 38.
*Toxic Reaction to Thiourea: Report on 3 Cases. C. R. St. Johnston.—p. 42.
Delayed Suture of Soft Tissue Wounds. A. I. S. MacPherson.—p. 43.
*Penicillin and Smallpox: Report of 4 Cases. W. D. Jeans, J. S. Jeffrey and K. Gunders.—p. 44.

Toxic Reaction to Thiourea.—St. Johnston states that, of 7 patients with thyrotoxicosis treated with thiourea, 3 developed toxic reactions. Pyrexia of 101 to 104 F. occurring eight to ten days after administering thiourea, with palpable enlargement of the spleen, a fall in the white blood cell count with monocytosis and a maculopapular eruption, was present in all 3 cases and appeared to be due to the thiourea. The 3 cases were remarkably similar. All symptoms and signs disappeared when the drug was withdrawn, to reappear in the first case when it was readministered.

Penicillin and Smallpox.—According to Jeans and his co-workers 37 patients with smallpox were admitted to a hospital in Italy during the spring of 1943. Two men soon died, covered with pustules. Four other men were critically ill and death seemed likely. They were covered from head to foot with vesicles which were becoming pustular and in places confluent. Throat and buccal mucous membranes were pustular and ulcerated. All 4 patients had had a course of sulfathiazole orally early in illness. Cultures from the pustules thereafter showed *Staphylococcus aureus* in abundance. The patients were then given sodium penicillin, 15,000 units intramuscularly every three hours, for three to four days (average 400,000 units). In the 3 that recovered there was a pronounced improvement within twenty-four hours. The quick drying of the pustules and subsequent minimal pock marking was quite striking. One of the patients who survived had never been vaccinated. The fatal case was one of confluent smallpox. The patient had been successfully vaccinated in the army in 1943 but never previously.

2:65-96 (July 15) 1944

- Vital Statistics of 1943. P. Stocks.—p. 65.
Visual Problems of Aerial Warfare. P. C. Livingston.—p. 67.
*Proflavine Powder in Wounds. R. W. Raven.—p. 73.
Phosphatase and the Repair of Fractures. G. Blum.—p. 75.
Impetigo Contagiosa Treated with Microcrystalline Sulfathiazole. J. W. Bigger and G. A. Hodgson.—p. 78.

Proflavine Powder in Wounds.—Raven describes the effects of proflavine (2:8-diaminoacridine sulfate) in the treatment of wounds. All patients had received a chemotherapeutic drug before they reached the author. In the local treatment of wounds care is taken to ensure cleanliness of the skin surrounding the wound. Hair is shaved, purulent discharge is mopped

away and the skin is cleaned. If oil is present, ether soap is used; for ordinary contaminants soap and water suffices. A solution of 1 in 1,000 proflavine is then applied. Dead tissue is excised, avoiding sacrifice of good skin, and easily accessible foreign bodies are removed. Free drainage of the wound must be established. Next the wound is gently mopped with swabs soaked in a solution of proflavine so that a moderately dry cavity is obtained. Proflavine powder is carefully inserted into all parts of the wound, especially where there is a comminuted fracture of bone. The amount of proflavine powder used varies with the size of the wound. In most cases it has not exceeded 0.5 Gm. One layer of wide mesh gauze lightly impregnated with petrolatum is laid over the wound. In fractures, alignment of the bone fragments is secured and the part is immobilized in plaster over an adequate amount of cotton wool, which absorbs the wound discharge. If a joint is involved, it is immobilized in plaster in the correct position. Plaster is usually changed after about ten days. Proflavine was used not only in wounds involving bones and joints but also in suppurative lesions of the soft tissues and in burns. To ascertain its prophylactic value it has been applied to fresh wounds. The danger of overdosage is emphasized. In suppurating battle wounds the use of proflavine leads to satisfactory healing within a reasonable time and with a notable lack of scar tissue. Various infected lesions have been treated with a powder consisting of proflavine, sulfanilamide and ascorbic acid, and this combination has proved satisfactory for suppurating wounds, cellulitis and large chronic ulcers of the leg.

Schweizerische medizinische Wochenschrift, Basel

73:1221-1244 (Oct. 2) 1943. Partial Index

Clinical Aspects of Mental Depressions. J. Wyrsch.—p. 1221.

Pulmonary Infiltrates in Infectious Icterus of Weil. S. Moeschlin. p. 1227.

*Actinomycosis of Lung Cured with Irgamid N-Dimethylacryl Sulfanilamide: Case. C. Merkle.—p. 1230.

Endobronchial Perforation of Hilar Tuberculous Adenitis with Elimination of Lymph Node Sequestrums. P. Steiner and M. Geissberger.—p. 1232.

Actinomycosis of Lung Cured with a Sulfonamide.—Merkle reports the case of a farmer, aged 44, in whom actinomycosis started in carious teeth and involved the mandible with formation of fistulas and board hard infiltrations on the chin. A pleural empyema developed either as the result of the mandibular abscess invading the mediastinum, or the lung and pleura becoming involved by aspiration. In spite of the prolonged administration of large doses of potassium iodide and roentgen irradiation, the patient continued to have fever, leukocytosis, increased sedimentation reaction, suppurating fistulas of the mandible and fetid sputum containing *Actinomyces mycelium*. The patient was given 6 Gm. of n-dimethylacryl sulfanilamide daily for a period of seventeen weeks. This resulted in a cure. The patient has now remained well for four months. The total amount of 568 Gm. of the sulfonamide was well tolerated. In view of the great resistance of actinomycosis, the author regards it as unlikely that the chemotherapy acts directly on *Actinomyces*. Since *Actinomyces* is a saprophytic fungus and since actinomycoses with mixed infections are especially resistant, the author thinks that the administered sulfonamide preparation destroyed the favorable growth medium of *Actinomyces*.

Analecta Medica, Mexico, D. F.

5:1-34 (April-June) 1944. Partial Index

Development, Improvement and Perspective of Neurosurgery. S. Obrador Alcalde.—p. 1.

Actual Clinical Conception of Uremia. S. García Téllez.—p. 17.

*Therapy of Pleural Empyema. J. L. Gómez Pimienta.—p. 25.

Therapy of Pleural Empyema.—Gómez Pimienta classifies pleural empyema into tuberculous, septic and mixed types. Simple tuberculous empyema develops in patients with efficient artificial pneumothorax. Pleural drainage is here interdicted. Treatment consists in aspiration of the pleural cavity and lavage with 10 or 20 cc. of Lugol's solution in 1,000 cc. of isotonic solution of sodium chloride. Extrapleural thoracoplasty is indicated when the preservation of pneumothorax is necessary because of the severity of the tuberculous lesion. Tuberculous

empyema complicating active pulmonary tuberculosis develops in patients with inefficient artificial pneumothorax. The therapy consists in extrapleural thoracoplasty after emptying of the pleural cavity by aspiration and lavage. Mixed tuberculous and streptococcal or pneumococcal empyema is caused by pulmonary perforation or by exogenous contamination. Treatment consists in aspiration, administration of a sulfonamide, preliminary intercostal pleurotomy and extrapleural thoracoplasty. Septic empyema is treated with a sulfonamide, aspiration of pleural contents and subsequent pleural drainage. The latter is resorted to only after the tuberculous pulmonary lesion has become quiescent, as shown by the transformation of the pleural fluid to pus and after formation of mediastinal and pleural adhesions, which tend to immobilize the mediastinum and limit the size of the postoperative pneumothorax.

Prensa Médica Argentina, Buenos Aires

31:1041-1080 (June 7) 1944. Partial Index

Gastroscopy in Diagnosis of Gastric Cancer. J. Nasio.—p. 1041.

*Dextrose in Pleuritic Effusion: Prognostic Importance. O. A. Garré, L. Desimone and R. Mingrone.—p. 1053.

Costal Tuberculosis. H. A. Passalacqua, L. Farias and J. O. Gutiérrez.—p. 1058.

Dextrose in Pleuritic Effusion.—Garré and his collaborators state that the amount of dextrose in pleuritic effusion is of prognostic significance. They made quantitative determinations in pleuritic effusion of 27 patients. They found that the average amount of dextrose for each thousand cubic centimeters of fluid was 0.2702 Gm. in purulent pleurisy, less than 0.60 Gm. in serofibrinous pleurisy and more than 0.60 Gm. in nonpurulent pleurisy. In effusion with an amount of less than 0.60 Gm. of dextrose for each thousand cubic centimeters of the fluid, smears and cultures are positive for tubercle bacilli. In fluids containing an amount of more than 0.60 Gm. of dextrose for each thousand cubic centimeters of fluid, smears and cultures are negative for tubercle bacilli.

Archiv für klinische Chirurgie, Berlin

204:211-444 (March 26) 1943

Therapy of Infected Gunshot Injuries of Joints. H. Hellner.—p. 211.

Callus Formation and Fracture Repair in Fractures of Diaphysis of Forearm, with Particular Reference to Pseudarthrosis. S. Annersten.—p. 299.

*Significance of Sugar Tolerance Test in Diagnosis of Commotio Cerebri. W. Osterchrist.—p. 332.

Experiences After Resection of Large Portions of Large Intestine. F. L. Duschl.—p. 344.

Indications for Early Operation of Injuries of Blood Vessels and of Aneurysms. H. Killian.—p. 355.

Roentgenologic Demonstration of Aneurysms in Wartime. C. H. Schröder.—p. 411

Sugar Tolerance Test in Commotio Cerebri.—Osterchrist points out that in the large majority of cases diagnosis of commotio cerebri is dependent on the statements of the injured or of witnesses, because there is no reliable method of clinical examination. Osterchrist investigated the sugar tolerance of 25 patients hospitalized with the diagnosis of commotio cerebri. These were not selected and clinically proved cases. The results of his tests are recorded in two tables. Table 1 records all cases that showed definitely pathologic curves, table 2 those with normal sugar tolerance curves. The sugar tolerance test permits differentiation of traumatically induced loss of consciousness from that caused by fainting, hysteria, coma and the like. Every traumatically induced loss of consciousness is accompanied by a temporary disturbance in the blood sugar regulation. This disturbance is frequently revealed in a pathologic increase in the fasting blood sugar and invariably in an abnormal course of a blood sugar tolerance test. Dextrose tolerance tests are valuable for the corroboration of the diagnosis of commotio cerebri. Cases with normal blood sugar tolerance curves are not true cases of commotio cerebri but are those of a traumatic shock. The author explains the concurrence of abnormal blood sugar levels with commotio cerebri as the result of a local traumatic impairment of the middle part of the hypothalamus with its sensitive functional centers.

Book Notices

Infections of the Peritoneum. By Bernhard Steinberg, M.D., Director of Toledo Hospital Institute of Medical Research. With a foreword by Frederick A. Collier, M.S., M.D., Professor of Surgery, University of Michigan Medical School, Ann Arbor. Cloth. Price, \$8. Pp. 455, with 45 illustrations. New York & London: Paul B. Hoeber, Inc., 1944.

Much has been written on peritonitis from many points of view by many authors. Dr. Steinberg's book is a comprehensive review of this voluminous material as well as the report of his intensive experimental and clinical work on the subject for eighteen years. There is more emphasis placed on the relation of basic sciences to the condition than in most publications dealing with peritonitis. Most of Dr. Steinberg's researches have dealt with etiology and pathogenesis, and his conceptions are deserving of widespread dissemination among the medical profession. Uniform understanding of the early stages of peritonitis and its development would result in earlier and better treatment and a corresponding reduction of mortality. The basic principles expounded so well by Steinberg are of great importance in the management of this condition. There has been a tendency toward slighting them and substituting indiscriminate chemotherapy. While chemotherapy is of great value, it cannot as yet, and may never, displace basic surgical principles. Steinberg brings this out well, and for this reason his contributions are not only important but timely. Though this book is perhaps too comprehensive to be read and digested by all "accelerated" medical students, it is worthy of being carefully read by all doctors who may come in contact with peritonitis.

Infectious Anemias Due to Bartonella and Related Red Cell Parasites. By David Weinman. Instructor in Comparative Pathology and Tropical Medicine, Schools of Medicine and Public Health, Harvard University, Boston. Transactions of the American Philosophical Society Held at Philadelphia for Promoting Useful Knowledge. New Series—Volume XXXIII, Part III. Paper. Price, \$1.25. Pp. 243-350, with 2 illustrations. Philadelphia: American Philosophical Society, 1944.

This monograph is an intensive study of bartonella infections in man and animals with a digest of the literature (723 references). In man, Carrion's disease (Oroya fever and verruga peruana) as well as asymptomatic bartonellosis are encountered in Peru, Colombia and Ecuador. There is suggestive evidence that the area, which appears to correspond with the distribution of certain species of sandflies of the genus *Phlebotomus*, may be spreading. The bacteriology, symptomatology, blood changes, pathology and therapeutic measures are presented in detail and discussed. A chapter is devoted to the public health aspects of bartonellosis. As Dr. Tyzzer notes in the introduction, "the present monograph should serve as a reliable, modern and full source of information and reference; the South American literature, which is so difficult of access, being particularly well represented."

Technique in Trauma: Planned Timing in the Treatment of Wounds Including Burns. From the Montreal General Hospital and McGill University. By Fraser B. Gurd, M.D., C.M., and F. Douglas Ackman, M.D., C.M. In collaboration with John W. Geisler, M.D., C.M., Edward S. Mills, M.D., C.M., Joseph R. Pritchard, M.D., and Frederick Smith, M.D. Preface by John S. Lockwood, M.D., University of Pennsylvania, Philadelphia. With commentary by Ralph R. Fitzgerald, M.D., C.M., McGill University, Montreal. (Reprinted from the *Annals of Surgery* with additional text.) Fabrikoid. Price, \$2. Pp. 68, with 20 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1942-1944.

This little volume is an attractively bound reprinting of three papers by the Montreal group which have appeared in the *Annals of Surgery* plus a foreword by John S. Lockwood and a commentary by Ralph R. Fitzgerald. The first two sections deal with the treatment of burns, and since the first was originally published in November 1942 it contains considerable material which is out of date. For example, it is recommended that tannic acid and silver nitrate be applied to large surface areas on the trunk or thighs. This method has fallen into disrepute, a fact which was recognized by the authors in the second paper, which appeared in December 1943, in which the exclusive use of a sulfathiazole emulsion was advised. The first paper mentions the use of a "burn tent" for the application of external heat. There is much evidence at hand that more harm than good is done by thus combating the so-called shock of

burns. The photograph of the tent in operation shows a patient apparently almost hermetically sealed in with a battery of heating lamps. It is doubtful that the conscious patient would tolerate such anoxic and uncomfortable conditions for long. On the other hand, appropriate stress is placed on the avoidance of unnecessary dressings and on the value of early dermatome skin grafting.

The third section considers the treatment of other types of injuries and infections. In a general way the authors favor the "let alone" methods of Orr and Trueta. There is generous use of the M. G. H. (sulfathiazole) emulsion for local implantation in wounds. There is no statistical proof of the necessity for the use of the sulfonamide. Anticipating this objection in his commentary, Fitzgerald states that controls are impossible in clinical surgery. This view is hardly tenable in the light of the published statistical studies of Meleney and the collaborating study units of the Committee on Medical Research in this country.

This monograph is a valuable record of the point of view of one group of surgeons interested in giving the best possible care to patients with various kinds of trauma. It is not, however, a handbook which the novice can use for a quick solution to all his problems in the treatment of the injured.

Fundamentals of Internal Medicine. By Wallace Mason Yater, A.B., M.D., M.S., Professor of Medicine and Director of the Department of Medicine, Georgetown University School of Medicine, Washington, D. C. Second edition. Fabrikoid. Price, \$10. Pp. 1,204, with 275 illustrations. New York & London: D. Appleton-Century Company, Inc., 1944.

This edition continues the policy set forth in the first, which appeared in 1939; it supplies in the briefest possible space the minimum of information necessary to deal with diagnosis and principles of treatment in clinical medicine exclusive of surgery. Subjects of special value to the internist in the armed forces have been added. Others, including primary atypical pneumonia, blood typing, hypoproteinemia, steatorrhea, sarcoidosis and coccidioidomycosis, have been revised or rewritten. A preliminary evaluation of the use of penicillin also has been included. There are fourteen contributors, including Dr. Yater. This is a true textbook rather than a reference book: the elimination of much material found in many similar publications unfits it to serve most reference purposes. Preparation of a book of this kind is now a colossal task. The appearance of a new edition at this time constitutes *prima facie* evidence of its popularity.

An Atlas of Anatomy in One Volume. By J. C. Boileau Grant, M.C., M.B., F.R.C.S., Professor of Anatomy in the University of Toronto. By Regions: Upper Limb, Abdomen, Perineum, Pelvis, and Lower Limb, Vertebrae and Vertebral Column, Thorax, Head and Neck. Reprinted 1944. Cloth. Price, \$10. Pp. 398, with 460 illustrations. Baltimore: William Wood & Company, [1944].

Designed to meet the needs of teachers and students and also those of physicians and surgeons, Grant provides in one volume a regional atlas that follows the method of dissection taught in American schools. It also should prove useful in clinical work. The structures of the human body are shown region by region: upper limb, abdomen, perineum, pelvis, lower limb, vertebrae and vertebral column, thorax, and head and neck. The drawings are by Mrs. Dorothy I. Chubb, a pupil of the late Max Broedel. To assure accuracy of the plates, each illustration is based on photographs of each specimen. A majority of the plates are colored, many of them in three, four or more colors. There is a detailed index providing a quick reference to the plates depicting any structure.

Accident Facts: 1944 Edition. Prepared by the Statistical Division, National Safety Council, Chicago. Paper. Price, 50 cents. Pp. 96, with illustrations. Chicago: National Safety Council, Inc., 1944.

The 1944 edition of Accident Facts presents in graphic form, and by means of tables and text, the important information concerning accidents in the United States during the calendar year 1943. This well organized booklet is indexed and one can find readily the total number of accidents by cause, by age group, by occupation and by geographic location and almost any other information on accidents which it is important to know. The National Safety Council deserves the full support of the medical profession in its efforts to reduce this leading cause of death and disability.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TRANSMISSION OF POLIOMYELITIS

To the Editor:—How is infantile paralysis transmitted? The town where I live (population 1,200) has had 2 cases within the last three weeks and the cry for effective prophylaxis is being sounded. According to articles available to me, there are two schools of thought. Dr. Stimson (The Journal July 10, 1943, p. 764) says that "it has not been proved that flies can carry enough [virus] to infect human beings." Maxcy and Howe, as quoted in the editorial Dec. 4, 1943, page 904, assume that "the disease would not attack children preponderantly, as is the case, were it transmitted primarily by the fly or any other insect." On the other hand, Rosenow, South and McCormack (Kentucky M. J. 35:437 [Sept.] 1937) and Trask, Paul and Melnick (J. Exper. Med. 77:531 [June] 1943) quoted in your editorial on Aug. 28, 1943, page 1250, accumulate data that a high percentage of flies, swarming around sewage-polluted water—is able to infect experimental animals. The reasoning of Maxcy and Howe seems to be fallacious, as (a) children are not exclusively attacked by poliomyelitis in our epidemic, (b) the relative immunity of adults may be easily explained by a possible previous abortive poliomyelitis infection and (c) the seasonal distribution of poliomyelitis seems to favor indirect, rather than direct, contact. In winter children are much more crowded, with more intimacy and more pharyngeal discharge; the first frost usually kills flies and the poliomyelitis epidemics; does it make little boys wash their hands more? The fact that both our cases appeared in families living near the sewer infected Housatonic River, swarming with flies, makes me think of a possibility of an insect vector.

George Vash, M.D., Hinsdale, Mass.

ANSWER:—The method of transmission of the virus of poliomyelitis has not yet been clearly demonstrated. Up to a few years ago the nasopharynx was accepted almost universally as the common port of entry as well as the port of exit of the virus of poliomyelitis. This theory enjoyed wide acceptance until three or four years ago, when the gastrointestinal port idea was reemphasized. The virus has been found consistently in the alimentary tract and stools of both patients and contacts. While a large body of circumstantial evidence supports the theory of direct contact from patient to patient, there is also the fact that virus has been recovered repeatedly from flies trapped in epidemic areas. However, the importance of the fly as a vector has not yet been clearly demonstrated. It is not possible in the present state of knowledge to say whether the contamination of the fly with virus is a result of the disease or a causal factor in it. The seasonal incidence of poliomyelitis epidemics, combined with the finding of virus in the human alimentary tract, stools, sewage and flies, lends weight to the contention that poliomyelitis is primarily an intestinal disease such as typhoid and dysentery. Not enough conclusive evidence has as yet been accumulated to permit a clearcut answer as to the usual mode of transmission.

SEBORRHEA OLEOSA

To the Editor:—A woman aged 27, married, without children, has an extremely oily scalp and oily face. She has no pimples and no blackheads. With the exception of a chronic sinus infection she is perfectly normal. She does have, however, attacks of hay fever. She has been checked thoroughly: blood, urine, heart, lungs, and all are within normal limits. The bowels are regular. I have tried many things but am unable to get rid of this oily condition. X-ray treatments were suggested to the patient, but she rebelled because of an unpleasant experience with x-ray burns. She will wash her hair, and within twelve hours the entire scalp will be greasy. Can you make any suggestions?

M.D., California.

ANSWER:—The case described is one of benign seborrhea oleosa, formerly called hyperhidrosis capitis (Jackson, G. T., and McMurtry, C. W.: Diseases of the Hair, Philadelphia, Lea & Febiger, 1912, p. 306) on the now discounted theory that the oil was a product of the sweat glands instead of the sebaceous glands.

Clinical investigations of the effect of large doses of vitamin A, vitamin D, niacin, pyridoxine or liver extract have produced evidence that each of these is effective in relief of some cases of acne vulgaris. Sex hormones, both male and female, have also been credited by some experimenters with good effects, by others with unfavorable effects. Such conflicts are also found in the research with vitamin A. One is forced to conclude that the causes of acne vulgaris are multiple and complicated. Some cases of acne rosacea also have been shown to respond to supplementation of the diet with large doses of riboflavin or of

pyridoxine or the combination of these two members of the B group. Other cases of acne rosacea do not respond to this treatment. The relationship between the various vitamins and their interaction with the hormones is complicated.

Sayer (Newer Concepts in the Etiology and Treatment of the Seborrhic Dermatoses, *Urol. & Cutan. Rev.* 46:719 [Nov.] 1942) reports good results in the seborrhic dermatoses from injections of crude liver extract 2 to 2.5 cc. once a week and a diet rich in vitamin B.

Local treatment may be helpful in the amelioration of the distressing features of the disease. It is presumed that hot packs to the face after soap and hot water cleansing have been tried as well as lotio alba. The latter can be used also on the scalp, if necessary in double strength (sulfurated potash 2 Gm., zinc sulfate 3 Gm. and bentonite lotion to make 30 cc.) applied to the scalp with a dropper after shaking the bottle. The bentonite lotion is made of 2.5 per cent of bentonite in rose water, allowed to stand several hours and then decanted to get rid of coarser particles (Fantus, Bernard, and Dyniewicz, H. A.: Cuticolor Preparations, *J. Am. Pharm. A.* 27:882, 1938). Daily application of this to the scalp results in drying of the hair as well as the stimulation of sulfur acting on the sebaceous apparatus.

In view of the objection to roentgen therapy, ultraviolet light may be used in dosage sufficient to cause a mild erythema.

ANTICOAGULANT TO FACILITATE INTRAVENOUS THERAPY

To the Editor:—Has an anticoagulant such as citrate or heparin been used to facilitate the slow administration intravenously of such solutions as penicillin or penicillin by avoiding clotting in the needle or adjacent vein, without using enough anticoagulant to affect the general coagulation time of the blood? Can you cite references to the literature?

Dell Theodore Lundquist, M.D., Palo Alto, Calif.

ANSWER:—So far as can be determined, anticoagulants have not been used to facilitate the slow administration of fluids intravenously. The flow of the solution itself is usually enough to prevent coagulation at the tip of the needle. Penicillin solution, for example, may be administered by continuous intravenous drip by allowing as little as 2,000 cc. of fluid to flow into the vein over a period of twenty-four hours. This slow passage of fluid through the needle usually prevents clotting of blood. It would seem to be advisable to avoid the use of citrate or heparin, since comparatively large amounts would have to be used to prevent clotting, particularly in cases in which the infusion is kept up for more than twenty-four hours.

SUTURES FOR REPAIR OF TENDONS

To the Editor:—What size and type of suture are recommended for repair of tendons? What is the usual length of time of splinting and the optimal time at which to start passive and active movement of the involved tendons? I realize that each case is different but would appreciate general information.

R. M. Nesemann, M.D., Kewanee, Wis.

ANSWER:—No. 6 or No. 8 silk (Champion scale) is an excellent suture material. The exact size used depends on the thickness and strength of the tendon. It is impossible to say in a few words how long the part should be immobilized and when motion should be begun after tendon repair. The paper entitled "The Rate of Healing of Tendon" by Mason and Allen in the *Annals of Surgery* 113:424 (March) 1941 is one of the best discussions of the subject and offers the surgeon definite help in deciding on the best plan of treatment in an individual case.

PANCREATIC EXTRACTS FOR DERMATOLOGIC DISORDERS

To the Editor:—What available evidence is there that pancreatic tissue extract topically applied has any therapeutic effect on chronic eczema?

Walter Wilson, M.D., Bridgeport, Calif.

ANSWER:—Several authors have reported on the use of pancreatic tissue extract in cutaneous disorders. In all of these reports the material was given by injection. No report has been found in which the topical application of pancreatic extract was made.

References:

- Roulett, Jack, and DeKay, E. W.: Use of Insulin Free Pancreatic Hormone in Treatment of Certain Types of Erythematous Skin Diseases, *J. Med.* 21:257 (Aug.) 1940.
- Downing, J. G.; Glicklich, E. A., and Messina, S. J.: Deproteinized Pancreatic Extract in Treatment of P-oriasis, *Arch. Dermat. & Syph.* 43:1125 (June) 1942.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 9

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

OCTOBER 28, 1944

PRESENT DAY PROCTOLOGY

CHAIRMAN'S ADDRESS

E. H. TERRELL, M.D.
RICHMOND, VA.

A cursory review of the history of medicine reveals that some interest has been manifested in proctology for many centuries. The etiology and pathology of the many diseases affecting the lower part of the bowel were not understood, and treatment was of the crudest and most unscientific sort until toward the end of the last century. It was not until about this time that any serious and orderly consideration of them was undertaken. Considerable impetus was given these studies by Dr. Joseph Mathews of Louisville, Ky., who has been considered the father of proctology. He was the first physician in the world to limit his practice to this field. Since his time there has been a continued and progressive advancement in the knowledge of these diseases.

Not unlike some other specialties, proctology has had to overcome certain prejudices, which were brought about largely because of indifference on the part of the profession or, probably to a greater extent, by incompetence. At any rate, this was for a long time a lucrative field for the advertising quack. During the latter part of the last century, and extending well into the early part of the present, the stigma of charlatanism was closely associated with proctology. There were, however, during this period a few ethical specialists who were doing good scientific work. Unlike the irregulars, they had nothing to conceal from either their fellow practitioners or their patients. For them there were no secret formulas, but whatever knowledge they possessed was given openly and freely. The more determined and enthusiastic of these in 1899 banded together in an organization which they called the American Proctologic Society, the purpose of which was the study and dissemination of knowledge pertaining to diseases of the rectum and colon. Since then great strides have been made in the understanding of the etiology of these various diseases; also greatly improved methods of diagnosis and treatment have been instituted. Now the skepticism toward proctology formerly held by the profession and some of the public has been, I believe, completely dissipated, and it holds as honorable a place as the other surgical specialties.

The proper limitations of the specialty have been much discussed but not determined definitely. There are some who confine their efforts to treatment of diseases within reach of the sigmoidoscope, probably 10 or 12 inches from the anus; others include surgery of the lower colon, colostomies and abdominoperineal resections for cancer or other conditions. Whether a proctologist shall attempt such a formidable operation as a resection is, of course, primarily dependent on his capabilities. If one has been well trained in this type of surgery he should by all means be encouraged to continue it, provided he has a sufficient number of these operations to maintain the proper technic. No operator wishes to shirk his duty or responsibility, but operations for cancer of the lower bowel, at best, carry with them much anxiety and oftentimes grief as well. When all has been said pro and con, each individual must be the judge of his own qualifications.

Proctology is one of the few specialties not overcrowded. There are many large and prosperous communities with no physician claiming any special knowledge in this line of work. Almost any one of these would support handsomely an energetic and well trained man. For a long time a gradually increasing interest has been shown in the study of proctology, although many wouldbe students are handicapped because there is an insufficient number of places where proper training can be obtained. While at present nearly every medical school has a department in proctology for undergraduates, the daily schedule is so crowded that the student, at best, can obtain only a rudimentary knowledge of the rectum and its diseases. There are, of course, a few postgraduate institutions with courses in proctology, but these can accommodate only a limited number of students. At present the best opportunity for a young man to receive proper training is to become associated, if possible, with an older and well-established proctologist. Unfortunately, there are only a few such opportunities.

Since specialists in rectal diseases are relatively few, a large amount of this work is done by the general surgeon and much, not requiring surgery, by the general practitioner or internist. It is most gratifying to note that among our best surgeons and internists there is an increasing tendency toward more frequent proctoscopies. Many of these men become proficient in diagnosis, as any one can by study and close observation. It is unfortunate, however, that the impression still prevails, as it has for a long time in some quarters, that rectal surgery is simple and can be performed satisfactorily by the newest intern. Not only should the surgeon always

Read before the Section on Gastro-Enterology and Proctology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

have in mind that his object is to remove existing pathologic conditions but he must so conduct the operation that, when healing is complete, there will be no impairment in the function of the parts. The accomplishment of these purposes usually requires a rather exacting technic, equal to that of most abdominal operations. I am confident that there are more unsatisfactory hemorrhoidectomies than appendectomies performed. In the hands of an experienced surgeon, however, a patient has every right to expect, when he submits to an ordinary rectal operation, that he will be completely relieved of symptoms and also that there will be no impairment of function of the parts. Of course, exceptions may occur in cancerous conditions and in some deep and extensive infections. I may add, however, that untoward results are by no means always due to a faulty operative technic. Oftentimes there are other causative factors, and chief among them is lack of proper after-care. Rectal wounds seem to require more attention than those of other parts of the body, and the conscientious surgeon gives them his personal attention unless he has a trained assistant to do this for him.

Often of great concern by the patient who contemplates a rectal operation is the possibility of an incontinence resulting. Loss of control is always to be deplored, of course, but there is little reason for its occurrence except in rare instances. The most common cause of this in the past has been the almost universal custom of forcibly dilating the sphincter muscles as a preliminary step in all rectal operations. This procedure of "paralyzing the sphincters," an expression often employed, was deemed absolutely necessary, particularly if the sphincters were at all spastic. Whether stretching was done with the fingers or with instruments, the muscle fibers often were injured to such an extent that their tone and contractability were destroyed, allowing a leakage to liquid or soft stools. The best informed proctologists no longer dilate the anal canal during any operation unless a fibrous constriction is present.

The postoperative care of a fistula is as important as the operation itself, and not infrequently a failure to cure is due to inadequate attention to the wound. For a time there were some who advocated excision of fistulous tracts with immediate suture. Failure to secure primary union was so common that the method has been abandoned almost entirely. Now it is considered best to leave the tract open to heal by granulation. Until recent years it was thought necessary to keep such wounds tightly packed until healing was complete. This practice has been discarded. It was observed that continuous pressure of the gauze forced apart not only the wound edges but also any muscle fibers which may have been incised. In the healing of a tightly packed wound there will be deposited a wider and more extensive amount of fibrous tissue which, because of its rigidity, necessarily interferes with the normal closure of the sphincters. Incontinence following fistulectomy is more often due to excessive scar tissue than to incised muscles. Of course, adhesions between adjacent raw surfaces must not be allowed to take place, but if such wounds are otherwise left alone the resulting scar will be narrow and interfere little, if at all, with the normal function of the sphincters.

Formerly the so-called "rectal plug" was used regularly by many surgeons on the completion of every

rectal operation. This was left in position for several days, the purpose being, it was said, to keep the muscles dilated, prevent adhesions and furnish an avenue of escape for gases. Such a foreign body in the anal canal caused much pain, requiring regular doses of opium to control. Also, when used, retention of urine was a frequent complication. As far as I know, the plug is no longer employed.

The proper interpretation of symptoms and an avoidance of hasty conclusions are necessary in the practice of proctology. Unless one is constantly on the alert there are many possibilities of error. It will be disconcerting, to say the least, to find, shortly after performing a hemorrhoidectomy, that there is a malignant growth only a few inches away. Again, at other times, small symptomless hemorrhoids are removed for pain, bleeding or itching when the symptoms have an entirely different cause. Rarely will a false interpretation be placed on rectal symptoms if a proper and painstaking investigation is made. Errors in diagnosis in this region are usually inexcusable, for most of them are due to carelessness.

When a perirectal abscess is incised the physician, for his own protection if for no other reason, should inform the patient that such an abscess is the first stage of a fistula and that a chronic draining sinus is likely to ensue; also, in all probability, a removal of the sinus or fistula will be necessary before relief is obtained. Too often, if reports are true, attempts are made to cure these tracts by irrigation, cauterization or packing. Such treatment is time consuming and always disappointing.

Every one at all interested in proctology should be familiar with the work of Dr. George Thiele of Kansas City. His contribution, in my opinion, is the most valuable given in our field during the past decade. I refer to a paper read by him¹ in this section and published in *THE JOURNAL* about five years ago, in which he called attention to spasm of one or more of the deep pelvic muscles causing symptoms previously not satisfactorily explained. The muscles involved are the coccygeus, pyriformis or levator ani, and their spasticity usually may be detected by palpation. Symptoms associated with this condition are somewhat variable, most often a feeling of pressure in the rectum or a dull aching, neuralgic in character, which sometimes extends to the vagina. Systematic and regular massage of the affected muscles, as suggested by him, gives relief in most instances. We have been pleased to note that frequently an associated coccygodynia and low back ache disappear also after massage of these muscles. Apparently no cause for this spasticity has been determined.

Most proctologists are conservative and attempt operations of only the most minor nature in their offices. Surgery of any magnitude is best done in a hospital where suitable assistance is obtainable and conditions in every respect more favorable. I am confident that often too much is undertaken in the office, particularly by young men with limited experience. Only one or two uncontrollable hemorrhages will suffice to convince any one that there are distinct limitations to office surgery. On the contrary, however, the well trained proctologist treats many ailments satis-

1. Thiele, G. H., Coccygodynia and Pain in the Superior Gluteal Region, *J. A. M. A.* 109:1271 (Oct. 16) 1937.

factorily in his office. Here, again, his knowledge of pathology usually will allow him to differentiate rather accurately whether a condition requires surgery or can be relieved by nonsurgical methods. There are borderline cases which treatment will benefit but not cure completely. In such instances surgery is advisable unless contraindicated because of age or physical disability.

The ambulatory treatment of hemorrhoids has become very popular in recent years. I fear that its limitations are not always understood. Only simple, uncomplicated, internal hemorrhoids are suitable for treatment by the electric needle or by injection of any one of the popular sclerosing agents. Surgery is indicated in all forms of hemorrhoids when associated with other diseases, as cryptitis, papillitis or fistula.

At present most surgeons employ the so-called ligature method in removing hemorrhoids. This seems altogether the most satisfactory and is followed by fewer complications than others. Some still use the clamp and cautery, although usually this causes more pain, and in healing there is deposited a greater amount of connective tissue; also secondary hemorrhages are more frequent. The Whitehead operation, very popular in some sections a few years ago, is almost obsolete now. Theoretically it was considered the perfect operation, but the end results in many instances were far from satisfactory.

Postoperative treatment in rectal surgery has changed materially in recent years. Unless there are unusual complications, soft diet is allowed the morning after operating. In forty-eight hours a bowel movement is secured by either a mild laxative or an enema, following which the patient is given general diet and is allowed out of bed ad libitum. Even within a few hours after operation he may be permitted to stand if there is difficulty in voiding. In allowing this no harm has been observed, but often retention and catheterization, always objectionable complications, may be avoided. Hot sitz baths and hot compresses add much to the comfort of the patient and are conducive to healing. Unless the operation has been extensive or an unusual one, the patient leaves the hospital in four to six days. He is requested to report to the office regularly every few days until healing is complete. At these visits any tendency to adhesions or bridging of the wounds is forestalled and excessive granulation tissue removed. Success or failure of operations on the rectum is more often dependent on the amount and nature of the after-care than is generally admitted.

Many surgeons have reported favorable results from topical applications of the sulfonamides to open postoperative wounds. It has been my experience that their use has not reduced noticeably the time of healing, and in no way have they seemed superior to the mild antiseptic wet dressings and sitz baths which have been employed for many years. These drugs, however, administered internally are most effective and indispensable in many deep seated infections. In addition, certain of them are more or less specific in many cases of ulcerative proctitis. All drugs of this class are dangerous and should not be prescribed indiscriminately. For myself, when I think they are indicated I prefer that they be administered by and under the close supervision of an internist or a gastroenterologist. The medi-

cal practitioner is better able to keep a close watch and detect in their incipience any untoward effects, should they arise. In fact, there should be a close cooperation between the gastroenterologist and the proctologist. There are innumerable occasions in which they may be of mutual benefit.

Most of us are more or less creatures of habit. We often prescribe remedies or employ methods handed down from one generation to another without consideration as to their merits. One in particular is the custom, in some localities at least, of prescribing ointments and suppositories containing opium for inflamed and painful conditions at or near the anal outlet. Few drugs are absorbed through the unbroken skin. Opium is not a local anesthetic and, when applied or inserted into the rectum, can relieve pain only after it is absorbed into the blood stream. A mild antiseptic wet dressing with a hot water bag over it is generally more effective than any ointment or suppository. Most of the popular ointments and suppositories owe their reputation to the fact that they are used generally in acute, self-limiting diseases.

The physician should discourage the indiscriminate use of laxatives. One is sometimes surprised how quickly a sluggish and inactive bowel will respond to simply a regulation of diet and habits, when the patient is fully cooperative. Frequently, however, some aid other than laxatives is necessary. For this purpose preparations containing seed taken in 1 to 2 teaspoon doses daily are very effectual in many instances. They seem not to have any of the detrimental effects of liquid petrolatum, which for many years has been used extensively in chronic constipation. Oil interferes with digestion, prevents proper assimilation of food and prevents absorption of certain vitamins. The taking of oil, except for a very limited time, should be discouraged.

Some physicians make it a rule to order a roentgenoscopy whenever cancer of the lower bowel is suspected. A tumor located in the ampulla of the rectum often is not diagnosed definitely by the x-rays. When the report is found to be inconclusive, a proctoscopy is requested. The procedure should be reversed. If a growth is located through the proctoscope a biopsy specimen will determine the diagnosis definitely. Then roentgenoscopy is generally not necessary.

We are passing through an era of great progress in medicine. Proctology has kept pace with all other progressive departments of medicine and probably is ahead of some. These accomplishments have been the result of contributions of many interested, hard working and observant individuals. We have by no means, however, reached the stage of perfection. That new ideas and improved methods will continue to be brought forth from time to time there is no reason to doubt; that is, while we remain free and independent agents. When, however, the practice of medicine becomes regimented, as is strongly advocated in certain quarters, most certainly progress will be at an end. Then medicine will be practiced carelessly and indifferently.

One cannot imagine that physicians of today will tolerate the dictatorship of a centralized group of selfish and autocratic politicians, whose chief interest is not that of their dear constituents, as they claim, but that of feathering their own political nests.

116 East Franklin Street.

CHRONIC GLOMERULONEPHRITIS AND THE NEPHROTIC SYNDROME

A FOLLOW-UP INVESTIGATION OF PATIENTS
TREATED WITH ACACIA

RAYMOND E. SMALLEY, M.D.

First Assistant in Medicine, Mayo Clinic
AND

MELVIN W. BINGER, M.D.

ROCHESTER, MINN.

"It is indeed an humiliating confession that although much attention has been directed to nephritis for nearly ten years—yet little or nothing has been done toward devising a method for permanent relief, when the disease has been confirmed; and no fixed plan has been laid down as affording a tolerable certainty of a cure in the more recent cases." Richard Bright¹ wrote the foregoing in 1836. In 1944 we still must confess that we cannot cure the patient who has this disease, but the plan of treatment² here to be described restores many of the patients to work and eases the sufferings of those who are bedfast.

Our purpose in this study was to ascertain the health of the patients and the status of the disease from which they suffered in the interval between the time of their first treatment at the Mayo Clinic and the time of the follow-up investigation. At the time of admission at the clinic the 109 patients selected for study had in common glomerulonephritis and the nephrotic syndrome, extensive and resistant edema, and they were treated with injections of a solution of acacia in the years 1937 to 1943 inclusive. By "nephrotic syndrome" is meant the clinical state characterized by albuminuria, the presence of edema and a decreased concentration of serum albumin. In addition, the concentration of blood cholesterol usually is elevated and not infrequently the basal metabolic rate is lowered. Two of the 109 patients, in addition, received diagnoses of Hodgkin's disease; 1 other patient had indeterminate edema and 1 chronic hepatitis. Of the 109 patients, 72 were alive and 25 were dead at the time of the follow-up investigation; we received no response concerning 12. Of the 72 patients known to be living, 27 were more than 40 years of age at the time when data for this report were gathered.

Glomerulonephritis with nephrotic tendencies is primarily a disease of children and young adults. Grouped according to decades of life, most of the patients were in their teens when the symptoms became evident and the next largest number were in the third decade of life. Three patients were less than 10 and 2 were more than 68 years of age. The exact age of the onset is difficult to determine because patients without extrarenal symptoms frequently do not go to a physician. It has been said³ that even now in the majority of instances the presence of Bright's disease remains unsuspected and that only a small proportion of all people with this disease ever lie on a postmortem table or even in a hospital bed. Most of our patients had had symptoms of renal disease for three to four

years when first seen at the clinic; in 5 of the cases the kidneys had been known to be involved longer than ten years and in 2 of them longer than eighteen years. Males seem to be more susceptible to the disease than females. In our series of 72 patients who could be followed up 39 were men and 33 women.

These patients complain chiefly of malaise and of discomfort from the edema. In a severe case the legs are so swollen that to walk is troublesome. Swelling of the genitalia may make urination difficult and painful; edema of the abdominal wall and ascites cause distention, impede respiration and cause slowing of gastric motility; pleural effusion causes dyspnea and may embarrass the circulation; edema of the stomach and intestine causes loss of appetite, indigestion, nausea, vomiting and intestinal irregularity; cerebral edema may cause headache, mental confusion, lethargy and possibly psychosis. All but 3 of the group of 109 patients had edema, varying from pitting edema at the ankles, sometimes extending upward to the knees or hips, to generalized anasarca with fluid in the body cavities. Forty-two patients had clinically demonstrable fluid in the pleural or peritoneal cavities.

Our plan of treatment is directed toward removing the edema and helping to restore the normal concentration of serum protein. Dietary aids consist in restriction of intake of sodium and protection of the normal concentration of serum protein. Patients are instructed to take either a salt free diet or one containing only the salt used in preparation of the food. Intake of fluids is limited to not more than 1 to 1½ quarts (approximately 1 to 1.5 liters) daily. The protein content of the diet is increased to between 75 and 125 Gm. daily because of the excessive proteinuria that is one feature of the nephrotic syndrome. There is no evidence that forced injection of protein produces a significant rise in the concentration of serum protein, although it may prevent progress of hypoproteinemia. Vitamins and iron may be used to supplement the diet. Potassium nitrate is used indefinitely in a dose of 3 Gm. three times daily. This diuretic drug has low toxicity, is easily administered and has the desired diuretic action. Administration of acacia is indicated when renal function is good, the concentration of serum protein is low and the edema does not respond readily to treatment in the hospital. The usual total dose is 90 Gm.; that is, a 6 per cent solution of pure acacia in 1,500 cc. of a 0.06 per cent solution of sodium chloride. One third of this quantity is given in each of three intravenous injections administered usually on alternate days. In the average case in which the intake of fluid is controlled, this quantity will give a concentration of approximately 2 Gm. of acacia per hundred cubic centimeters of blood serum. It fails to give this concentration or if clinical edema is still present, further injection can be given. Mercurial diuretic drugs may be more effective after administration of acacia than before.

The acacia is gradually eliminated from the blood. One year after the administration the average concentration is 100 mg. per hundred cubic centimeters of serum. Power⁴ has reported 25 mg. per hundred cubic centimeters being found in the serum three years after the last injection. The concentration of acacia in the blood serum of 1 patient who recently returned for reexamination six years after her last injection of acacia was 10 mg. per hundred cubic centimeters.

From the Division of Medicine, Mayo Clinic.
1. Bright, Richard, cited by Loeb, R. F.: *Nephritis (Bright's Disease)*, in Cecil, R. L.: *Textbook of Medicine*, ed. 5, Philadelphia, W. B. Saunders Company, 1940, p. 1018.

2. Goudsmit, Arnoldus, Jr., and Binger, M. W.: *Treatment of Nephrotic Edema*, J. A. M. A. **114**: 2515-2517 (June 29) 1940. Lehnhoff, H. J., Jr., and Binger, M. W.: *Treatment of Edema of Renal Origin: Report of Twelve Cases*, *ibid.* **121**: 1321-1325 (April 24) 1943.

3. Addison, Thomas, and Oliver, Jean: *The Renal Lesion in Bright's Disease*, New York, Paul B. Hoeber, Inc., 1931, p. 15.

4. Power, M. H.; Keith, N. M., and Wakefield, E. G.: *The Persistence of Acacia in the Blood After Intravenous Injection of Acacia Solution*, *Am. J. Physiol.* **113**: 107 (Sept.) 1935.

She had received the average total dose of 90 Gm. of acacia. Twenty of the 25 patients who were dead at the time of the follow-up investigation had lost their edema when hospitalized at the clinic under treatment which included administration of acacia. Twelve⁴ of the 25 patients lived two years or longer after returning home. Five patients lived four years or longer. The listed causes of death were further manifestations of chronic Bright's disease, such as uremia, hypertension and cardiac failure in most of the cases; also acute appendicitis, mastoiditis, pancreatitis, septicemia and old age were reported.

We now propose to discuss certain manifestations of this disease, found at the initial examination and either at reexamination or at the time of the follow-up inquiry of the 72 living patients.

Of this number, at the time of the follow-up investigation 49 were doing a full day's work—substantial work as business executives, stenographers, farmers, housewives and students. One woman was teaching school in addition to caring for her house and family. Two patients were only slightly handicapped, 19 were working part time, at least half a day, and 2 were bed patients. One of the latter was a man 74 years of age.

Administration of acacia was instituted 103 times with reference to these 72 patients, and 342 separate injections were given. Most patients received 90 Gm. of acacia distributed in three injections; however, 1 patient has received nineteen injections, or 570 Gm., and 12 have received more than 200 Gm. No ill effects have been reported.

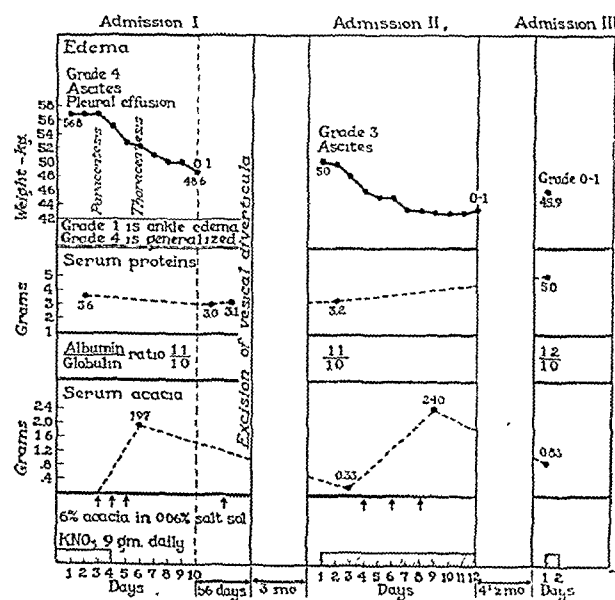
In 12 cases reactions occurred in the course of administration of the acacia. They consisted of coldness of the extremities, flushing of the face, chill,⁵ nausea, vomiting, dyspnea and urticaria. Two of these 12 patients had reactions two and three times, but all the patients were able to complete the necessary injections, including 1 patient with a proved allergy. In some instances epinephrine was given in the solution prophylactically to patients who had had one reaction, and this prevented recurrence.

Nephrotic edema may develop at any time during the course of the disease. One patient was relieved of clinical edema sixteen years after onset of the disease and 2 others twelve and eight years respectively after the disease began. Acacia was given to these 3 patients on one or two different occasions. All were working when this was written. Acacia was administered to these 72 patients at least two years, and to some of the patients seven years, before the time of this report. The mode of action of acacia is not certain, but it does facilitate excretion of sodium chloride and water.⁶ The value for blood chlorides was elevated on primary admission in most of the cases in which the value was determined. Once the excretion of sodium ion is initiated, edema fluid is restored to the circulation and then is eliminated by way of the kidneys. Under treatment, all 72 patients lost weight with the diuresis and with the decrease in edema. The average loss of weight was approximately 19 pounds (8.6 Kg.) per patient. Twelve patients lost 30 pounds (13.6 Kg.) or more and 3 lost 46.55 and 60 pounds (20.9, 24.9 and 27.2 Kg.) respectively. On the average, 1 to 2 pounds (0.5 to 0.9 Kg.) is lost daily.

The normal concentration of serum proteins is 6 to 8 Gm. per hundred cubic centimeters⁷ and the normal albumin-globulin ratio $\frac{1.5 \text{ to } 3.0}{1}$. Among 38 patients reexamined after administration of acacia on a previous visit the value for total serum proteins of 30 was found to have increased. In addition the albumin-globulin ratio of 2 had become normal. Clinically, 15 patients of this group of 38 had had ascites or demonstrable pleural fluid in addition to the peripheral edema at the time of the first admission but not at reexamination. Also 33 of the 38 patients had no edema or minimal edema of the ankles only at the time of the last admission, while all of them had exhibited considerably more edema than this when first seen at the clinic.

What has just been said about edema, serum acacia and serum proteins is illustrated in the following report of a case:

A woman aged 60, who was admitted to the clinic Sept. 20, 1941, stated that for five years she had had frequency, nocturia and dysuria without chills, fever or colic. Six weeks before she came to the clinic, while on a trip and after she had waded in



Record of patient's course

a cold stream, a cold had developed and at that time the patient first had noticed swelling of her ankles and legs. This condition had progressed until her abdomen had begun to swell ten days before her admission.

On examination the legs were found to be decidedly edematous and the edema extended upward to include the sacral and lumbar regions. She had ascites as well as effusion in both sides of the thorax, as shown in the accompanying chart. She weighed 125 pounds (56.8 Kg.). The blood pressure was normal and results of examination of the ocular fundi were essentially negative. Urinalysis revealed a specific gravity of 1.019, albuminuria graded 4 and pus graded 1. The blood contained 26 mg. of urea per hundred cubic centimeters and 3.6 Gm. of serum proteins. The albumin-globulin ratio was $\frac{11}{10}$. An intravenous urogram revealed multiple vesical diverticula, one of which contained a stone. The vesical findings were thought to account for the local urinary symptoms. A diagnosis was made of chronic glomerulonephritis with nephrotic features, and vesical diverticula with stone.

The patient was in the hospital sixty-five days after her first admission. At once a diet was prescribed which was free of

⁷ Peters, J. P., and Man, E. B. The Interrelations of Serum Lipid in Patients with Disease of the Kidney. *J. Clin. Investigation* 22:721-726 (Sept., 1943).

⁵ Goudsmit, Arnoldus, Jr.; Power, M. H., and Billman J. L. Some Effects of Injection of Acacia, with Special Reference to Renal Function. *Proc. Soc. Exper. Biol. & Med.* 47:254-257 (June) 1941.
⁶ Goudsmit, Arnoldus, Jr.; Binger, M. W., and Keith, N. M. Acacia in Treatment of the Nephrotic Syndrome, with Special Reference to Excretion of Chloride and Water; a Report of Cases. *Arch. Int. Med.* 68:513-524 (Sept.) 1941. Goudsmit, Power and Billman.

salt, high in protein and high in calories and of which the quantity of fluid was controlled. As a diuretic measure, administration of potassium nitrate in a dose of 9 Gm. daily was started but had to be discontinued after four days because of nausea. On the patient's third day in the hospital abdominal paracentesis was performed, and 1,200 cc. of fluid was removed. On the sixth day in the hospital 500 cc. of clear fluid was aspirated from the right side of the thorax. On each of the third, fourth and fifth days in the hospital injections of 500 cc. of 6 per cent solution of acacia were given intravenously, in all 1,500 cc., containing 90 Gm. of acacia. On the day following the last injection the concentration of serum acacia was 1.97 Gm. per hundred cubic centimeters. On the patient's tenth day in the hospital her weight was 107 pounds (48.6 Kg.) and her condition was improved enough to warrant surgical treatment for the vesical diverticula and stone. The postoperative course was essentially uneventful but, because edema of the ankles and legs developed, a fourth intravenous injection of 500 cc. of 6 per cent solution of acacia was given in the fourth postoperative week.

Three months after the patient's dismissal from the surgical service she was readmitted to the hospital because of increasing edema. Examination revealed pitting edema of the legs, including the hips, and ascites was present although the thorax was clear. She weighed 110 pounds (50 Kg.). There was no change in urinary findings from those of her first admission or in the results of examination of the ocular fundi. The concentration of blood urea was 24 mg. per hundred cubic centimeters and that of serum proteins 3.2 Gm. per hundred cubic centimeters. The albumin-globulin ratio was $\frac{1.1}{1.0}$. The value for serum acacia was 0.33 Gm. per hundred cubic centimeters. The patient was in the hospital twelve days on her second admission. Her diet was controlled as before. Potassium nitrate 9 Gm. was given daily. On each of the fourth, sixth and eighth days in the hospital 500 cc. of 6 per cent solution of acacia was administered intravenously, 1,500 cc. in all. On the day following the last injection of acacia the value for serum acacia was 2.40 Gm. per hundred cubic centimeters. The patient's weight decreased to 94 pounds (42.7 Kg.) and clinically she was free from edema. She was dismissed to go home with a prescription for a controlled diet and was advised to take 9 Gm. of potassium nitrate daily.

The patient was seen at the clinic on her third admission, four and a half months following the second dismissal. She came because her husband insisted that she be reexamined. She had been doing her own housework and climbing fifteen stairs twice daily without difficulty. Examination revealed minimal edema at the ankles. She weighed 101 pounds (45.9 Kg.). Blood pressure was normal. Urinalysis revealed albuminuria graded 3. The concentration of blood urea was 26 mg. per hundred cubic centimeters. The concentration of serum proteins was 5.0 Gm. per hundred cubic centimeters and the albumin-globulin ratio $\frac{1.2}{1.0}$. The value for serum acacia was 0.83 Gm. per hundred cubic centimeters. The patient was dismissed to go home and was advised to continue with the same treatment. She wrote us recently that she was getting along well.

Values for blood cholesterol ranging from 129 to 1,190 mg. per hundred cubic centimeters were obtained at the time of first admission of 65 of the 72 patients who later responded to our questionnaire. In 60 of these cases the values were primarily in excess of what we considered the normal of 160 to 200 mg. per hundred cubic centimeters. The values in 47 cases fell between 216 and 595 mg. per hundred cubic centimeters. The 2 patients most seriously ill at the time of writing of this paper had values of 378 and 490 mg. per hundred cubic centimeters. The patients with respectively the very high and the very low values were working and well. When the patients were placed under dietary control, the values for blood cholesterol that had obtained on primary admission fell rapidly toward normal; that is, in 1 case in which the value on primary

admission was 595 mg. per hundred cubic centimeters the value became 282 mg. per hundred cubic centimeters eight days later. It was also interesting that in cases in which values for serum protein on primary admission were low frequently hypercholesterolemia was found, while in cases in which values for serum protein were more nearly normal on primary admission the values for blood cholesterol were low. Peters and Mani reported that in their series of 54 nephritic patients the hypercholesterolemia bore no consistent relation to any single phenomenon of the disease. They stated that hypercholesterolemia was encountered most frequently in the presence of edema and that it was most striking in cases in which there was the greatest deficiency of serum albumin. From these observations it would appear that the initial value for blood cholesterol has very little prognostic significance.

We used retention of blood urea as an index of renal function in place of the urea clearance test because of the poor urinary output of this group of patients. This value is obtained by multiplying the value for ure nitrogen by the factor 2.14. The normal value range between 15 and 40 mg. per hundred cubic centimeters. On their first admission 26 of the 72 patients gave evidence of some renal insufficiency, as shown by elevation of the concentration of blood urea. These 26 patients had been known to have renal disease for from two to nineteen years, the majority for from two to nine years. The value returned to normal in 4 of these cases while treatment was being given in the hospital following the primary admission. In 8 more cases the values obtained on primary admission were decreased but were still above normal limits at the time of dismissal. The concentration of blood urea in 3 of the 8 cases later returned to normal. Also in 3 of the 26 cases the value for blood urea was elevated on primary admission, rose still higher while treatment was being given and was still elevated on dismissal; the value had returned to normal, however, at a later reexamination. This makes a total of 10 of these 26 patients whose measurable renal insufficiency evidently improved sufficiently to reach normal either while under treatment at the clinic or after their dismissal.

Four of the 72 patients had had the disease eleven years or longer. The values for blood urea were normal when they were first examined. The concentration of the blood urea of a fifth patient on primary admission, who also had had the disease eleven years or longer, was elevated to 46 mg. per hundred cubic centimeters.

Nine of the 72 patients had blood urea of normal concentration at the time of the first admission but gave evidence of renal insufficiency on reexamination. All 9 patients had had the disease from two to eight years when this elevation in value for blood urea was noted. In 4 of these 9 cases hypertension was an associated condition and, in all, apparently the hypertension was progressive.

We took 4,250,000 to 5,250,000 per cubic millimeter of blood as the normal erythrocyte count. For females 13 to 16 Gm. per hundred cubic centimeters of blood, and for males 14 to 17 Gm. was taken as the normal concentration of hemoglobin. By the foregoing standards 43 of the 72 patients were anemic on primary admission. Anemia finally develops in most cases of chronic nephritis. The lowest erythrocyte count was 2,040,000 and the lowest hemoglobin determination was 6.8 Gm. per hundred cubic centimeters. The leukocyte counts of 23 patients were increased when they were

first admitted; the highest leukocyte count was 16,200 per cubic millimeter of blood. By the foregoing standards, of the 38 patients later reexamined 8 who previously had been anemic gave normal values at reexamination; however, on reexamination 6 patients were anemic who had not been anemic on primary admission. The treatment of anemia in the presence of chronic nephritis is difficult.

Of 29 patients whose basal metabolic rates were estimated, 9 gave readings of more than —10 per cent on primary admission. In no case was the rate more than +10 per cent. The basal metabolic rates of 2 patients were —25 and —37 per cent. Also the blood cholesterol values of both of these patients were elevated respectively to 893 and 1,190 mg. per hundred cubic centimeters. The laboratory picture, therefore, resembled that seen in myxedema. Desiccated thyroid was used as an adjunct in treatment of these 2 patients. Both were working part time when this report was written.

Using determinations of blood pressure of 150 mm. of mercury systolic and 90 mm. of mercury diastolic as arbitrarily taken upper limits of normal, 27 of 38 patients who were reexamined had normal blood pressures at the time of the reexamination. Seven of these 27 patients had had hypertension at a previous visit. At the time of reexamination, hypertension was present in the 11 remaining cases of the 38. In 6 of these 11 cases the hypertension apparently had developed since the previous visit, while in the other 5 cases it had been present at a previous visit and had continued. The patients with hypertension represented all decades of life from the teens to the seventies. They had had renal disease for from two to nine years when hypertension developed; this period of antecedent renal disease is like that encountered in the cases of renal insufficiency. Four of the 11 patients with hypertension complained of exertional dyspnea and 4 of headache. These two groups of 4 overlap. This type of headache usually is frontal, is present in the early morning, on awakening, and usually lasts one to two hours.

Two of the 72 patients, both men, aged 18 and 24 years respectively, presented the ophthalmoscopic picture of developing retinitis.⁸ One had had knowledge of his renal disease for eight years and the other for two years. Also in both cases hypertension and nitrogen retention had developed since the patients first had been examined at the clinic. They both continued to have some clinical edema.

Retinitis at times may be reversible. In the ocular fundi of 4 patients were signs indicating regression of previous retinitis. Two of these patients, whose blood pressures had been elevated when they first had been seen at the clinic, had normal blood pressures at the time of their last visits. Slight nitrogen retention was found in examination of 3 of these 4 patients when they were last examined.

Using the microscopic evidence of erythrocyturia, leukocyturia and cylindruria, and the presence of albuminuria as criteria, 20 of the 38 patients reexamined gave evidence of improvement in urinary findings on reexamination; 11 of these patients showed some improvement, 5 showed definite improvement and the

urine of 4 was normal. These studies of the urinary sediment indicate that at the time of these examinations the disease was relatively quiescent but, as Addis and Oliver⁹ and Christian¹⁰ have pointed out, qualitative observations of the urinary sediment are only now and then decisive and are not prognostic.

In all cases in which values for plasma fibrinogen were determined, the results were within the normal limits of 300 to 600 mg. per hundred cubic centimeters. A tendency to bleeding was not exhibited by any patient following the use of acacia.

This follow-up study indicates that many of the patients who had resistant nephrotic edema and who were treated successfully with acacia and other treatments discussed have been able to maintain a more nearly normal economic and social existence than they had been able to lead before treatment. As was said in an earlier paragraph, we could not find any evidence that acacia was harmful in any way to these patients.

SEPTICEMIA AND BACTERIAL ENDOCARDITIS RESULTING FROM HEROIN ADDICTION

REPORT OF FIVE CASES

HUGH HUDSON HUSSEY, M.D.

THOMAS F. KELIHER, M.D.

BERTRAM F. SCHAEFER, M.D.

AND

BERNARD J. WALSH, M.D.

WASHINGTON, D. C.

The development of bacterial infection of the blood stream in narcotic addicts as a result of their addiction is a rare occurrence. This is somewhat surprising in view of the fact that so many addicts use morphine or heroin by injection and entirely without antiseptic technic. Most¹ has reported on the epidemiologic and clinical aspects of more than 200 cases of malaria in drug addicts in New York City. Apparently this disease is not uncommon, being spread through groups of addicts as a result of contamination of their injection equipment with blood containing the parasites. This assumption is based on the fact that it is common practice for addicts to employ a single syringe and needle for a series of injections in different individuals without the slightest attention to cleansing of the equipment between injections. Doane² reviewed the literature on the subject of tetanus acquired by narcotic addicts presumably as the result of using contaminated equipment for injection. He added 3 cases to the total of 9 cases previously reported by other authors. In addition, there have been several reports³ on the occurrence of

9. Addis and Oliver: The Renal Lesion in Bright's Disease, pp. 18 and 19.

10. Osler, William: Principles and Practice of Medicine, revised by H. A. Christian, ed. 13, New York, D. Appleton Century Company, Inc. 1938, pp. 867-868.

From the Department of Medicine of the Georgetown University School of Medicine and the Georgetown Division of the Medical Service at Gallinger Municipal Hospital.

1. Most, H.: Falciparum Malaria Among Drug Addicts: Epidemiologic Studies, Am. J. Pub. Health 30: 403 (April) 1940; Falciparum Malaria in Drug Addicts. Clinical Aspects, Am. J. Trop. Med. 20: 551 (July) 1940.

2. Doane, J. C.: Tetanus as a Complication in Drug Inebriety, J. A. M. A. 52: 1105 (April 5) 1924.

3. Wikler, A., Williams, E. G., Douglas, F. D., Emmons, C. W., and Dunn, R. C.: Mycotic Endocarditis, J. A. M. A. 119: 333 (May 23) 1942. Wikler, A., Williams, E. G., and Wiesel, C.: Monilemia Associated with Toxic Purpura, Arch. Neurol. & Psychiat. 50: 661 (Dec.) 1943.

8. Keith, N. M., Wagener, H. P., and Barker, N. W.: Some Different Types of Essential Hypertension: Their Course and Prognosis, Am. J. M. Sc. 107: 332-343 (March) 1939. Graham, R. W.: Ophthalmoscopically Visible Retinal Lesions in Chronic Glomerulonephritis: Occurrence and Characteristics, Arch. Ophth. 26: 435-465 (Sept.) 1941.

blood stream infection by *Monilia* in drug addicts, and in 3 cases mycotic endocarditis was found.

Over a period of about a year we have observed 5 cases of septicemia in heroin addicts, 4 of whom had acute bacterial endocarditis. Because the development of septicemia under these circumstances is unusual, these cases are reported here in detail.

REPORT OF CASES

CASE 1.—A man aged 45, Chinese, was admitted to the Psychiatric Division of the Gallinger Municipal Hospital for the treatment of heroin addiction of several years' standing. Because of language difficulties it was impossible to obtain an adequate history. He appeared acutely ill and had labored respirations. The blood pressure was 140/70, temperature 101 F., pulse rate 100 and respiratory rate 36. There were many needle puncture marks along the veins of both upper extremities. Several infected ulcers were present over the middle third of the left tibia. Three petechiae were visible in the left palpebral conjunctiva. Over the lower half of the right lung there were found diminished tactile fremitus and impaired resonance. Bronchovesicular breathing and subcrepitant rales were heard in this same area. A soft, nonradiating, apical systolic murmur could be heard. His abdomen was distended and tympanitic. Urinalysis showed 2 plus albumin, 2 granular casts and 18 red cells per high power field. The red blood cell count was 2,630,000, the white blood cell count 25,000 with 80 per cent polymorphonuclears, 13 per cent young forms, and 7 per cent lymphocytes. Type XXIV pneumococcus was found in the sputum. A blood culture taken on admission was negative.

Sulfathiazole was started on admission, and adequate levels were obtained. An x-ray film of the chest on the second hospital day showed diffuse pneumonitis in the lower half of the right lung. There was no apparent change during the ensuing two weeks except for the appearance of several petechiae on the hands and feet. His temperature fluctuated between 99 and 104 F. Severe chills occurred almost daily, but blood cultures were repeatedly negative. The white blood cell count remained elevated.

On the fifteenth hospital day sulfathiazole was discontinued and sulfadiazine started. An x-ray film of the chest showed some clearing of the pneumonitis at the right base. The chills continued, however, and on the sixteenth, seventeenth and eighteenth days positive blood cultures were obtained by another laboratory and *Bacillus pyocyaneus* was grown. New petechiae appeared on the chest and extremities, and the patient looked more severely ill and irrational. There was no change in the character of the temperature curve. On the nineteenth hospital day a short, high pitched early diastolic murmur of low intensity was heard in the second left intercostal space next to the sternum.

The remainder of the clinical course was steadily downhill. There were no significant alterations in the physical and laboratory findings. In view of the reported beneficial effects from the use of acetic acid in the treatment of *B. pyocyaneus* infection of the skin, and because the sulfonamides had shown no ameliorating influence on the disease in this case, 100 cc. of 1 per cent acetic acid solution was given by vein daily for five days. There was no observable effect from this treatment. The patient died on the thirty-ninth hospital day.

At necropsy the heart weighed 620 Gm. and was moderately dilated. The pericardial cavity was completely obliterated as the result of fibrinous pericarditis. The heart valves were normal except for a large, soft friable vegetation on the anterior cusp of the aortic valve. Just above this leaflet there was a mycotic aneurysm 3 cm. wide and 2 cm. deep. A culture of the vegetation was positive for *B. pyocyaneus*. The spleen weighed 350 Gm., was quite firm and contained 3 infarcts. There were also numerous small infarcts in the kidneys.

CASE 2.—C. S., a Negro aged 38, was admitted to the hospital because of cough and loss of weight. His illness had begun three months before admission with cough, anorexia and night sweats. On the advice of a friend the patient began taking heroin intravenously as a tonic. The drug had been administered daily by vein without use of antiseptic precautions of any kind. During the three months he had lost 18 pounds (8 Kg.) in weight. Just prior to admission he had become weak, dyspneic and febrile. A roentgenogram of the chest taken one week before admission had been reported as negative.

On examination the patient looked acutely ill and dyspneic. The temperature was 102.5 F., pulse 125, respiratory rate 32, blood pressure 110/68. The forearms showed scars along the veins at the sites of injection of heroin. The breath sounds were diminished and there were subcrepitant rales over the posterior aspect of the left lung at the base. The remainder of the physical examination was negative.

The urinalysis was normal. There were slight leukocytosis and mild anemia. An x-ray film of the chest showed areas of increased density in the lower half of the left lung and a slight increase in the transverse diameter of the heart. A blood culture taken on the third hospital day was reported to show *Staphylococcus albus*, but several subsequent cultures yielded *Staphylococcus aureus* which was coagulase positive. An x-ray film of the chest made on the seventh day revealed discrete areas of soft infiltration containing radiolucent centers scattered throughout both lungs.

The patient was given sulfamerazine, and adequate blood levels were maintained. His course was septic and rapidly downward. On several occasions he coughed up blood tinged sputum. Except for the development of rales in additional areas of the lungs, there were no new physical findings. The white blood cell count ranged between 18,000 and 21,000. He died on the fourteenth hospital day.

At necropsy the heart weighed 325 Gm. The valves were normal except the tricuspid, which was the site of a large mass of soft vegetations. Both lungs contained innumerable small abscesses of embolic origin. Cultures from the vegetations and from the lung abscesses yielded *Staphylococcus aureus*. The spleen was moderately enlarged.

CASE 3.—O. B., a Negro woman aged 25, was acutely ill when admitted to the hospital, and her history was vague. She was about six months pregnant and had been well until a few weeks before admission. Then she had developed fever, vomiting and symptoms of a respiratory infection, including sore throat and cough. Six days prior to admission she had anointed her skin first with alcohol and then with camphorated oil for relief of headache. The next day blebs had appeared on her skin, and the following day peeling had begun.

The patient looked stuporous and seriously ill. The temperature was 102.5 F., pulse 130, respiratory rate 48, blood pressure 120/70. The face was swollen, and there was extensive patchy exfoliation of the skin of the arms and chest with many cracked and bleeding areas. On the arms were several flattened bullous lesions. The mucous membranes and tongue were dry, and the pharynx was congested. At the base of the right lung resonance was diminished, and there were subcrepitant rales in both axillae and at the right base. The heart was normal in size. There was a short soft systolic murmur on the left of the sternum and a gallop rhythm. The uterus was enlarged to the level of the umbilicus. The fetal heart sounds were distinctly audible. Extensive raw areas were seen around the vulva.

Urinalysis showed albumin (1 plus), there was moderately severe anemia and the leukocyte count was 20,500. A blood culture taken on the first day yielded *Staphylococcus aureus*, and this organism was repeatedly obtained. The blood urea nitrogen was 16 mg. per hundred cubic centimeters. An x-ray film of the chest showed soft areas of infiltration scattered throughout both lung fields suggesting pulmonary infarcts.

The patient lived nine days after entering the hospital. She was treated with sulfamerazine for two days and then with

penicillin until the time of her death. The hematologic and bacteriologic findings remained the same, but the patient's general appearance improved temporarily after penicillin was started. High fever and tachycardia continued, however, and after the sixth day she became rapidly weaker. The fetal heart sounds were last heard on this day.

After she died it was learned from the patient's husband that she had been addicted to the use of heroin administered intravenously without aseptic precautions.

At necropsy the heart weighed 320 Gm. There were 3 gray, warty vegetations on the tricuspid valve. The other valves were not affected, and none of the valves showed evidence of preexisting disease. The peripheral parts of the lungs were filled with numerous small septic infarcts, many of which had formed abscesses. The liver was greatly enlarged as the result of cloudy swelling, and the spleen was slightly enlarged.

CASE 4.—A Negro aged 33, the husband of patient 3, was admitted to the hospital because of an abscess of the left antecubital fossa and for diabetic control. The patient had administered heroin to himself at irregular intervals by the intravenous route for seven years. However, for the preceding three months he had used the drug three times daily. Sterile precautions were not observed at any time, and on several occasions abscesses had developed at the sites of injection. The infection of the left antecubital space had been present for about a week. He stated that he and his wife used the same syringe and needle.

The only significant findings on examination included many scars along the veins of both upper extremities and an area in the left antecubital fossa which was swollen, warm, red, tender and firm. The temperature was 102 F., pulse 110, respiratory rate 20 and blood pressure 130/80.

Urinalysis showed 4 plus reduction of Benedict's solution. The red blood cell count was 4,270,000, the white blood cell count 11,300. The blood sugar was 400 mg. per hundred cubic centimeters. A blood culture taken on admission was negative. An x-ray film of the left elbow showed no evidence of bone or joint disease.

After two days of application of hot saline soaks to the area of cellulitis the patient's temperature returned to normal and the inflammation appeared to be subsiding. On the seventh and ninth days his temperature rose to 100 F. and on the eleventh day he had a severe chill with a rise in temperature to 103 F. His temperature remained elevated and fluctuated between 99 and 103 F. for the ensuing five days, during which time three positive blood cultures for *Staphylococcus aureus* were obtained. At this time the patient looked acutely ill and complained of profound weakness and severe generalized aches and headache. Sulfamerazine was started and adequate levels maintained. The temperature gradually fell to normal during the next six days and the patient appeared much improved. Three positive blood cultures for *Staphylococcus albus* were reported for this period. The local infection in the antecubital fossa became fluctuant and was incised. A small amount of pus containing *Staphylococcus aureus* was evacuated. Sulfamerazine was discontinued at this time and penicillin administered by the intramuscular route for the next seven days. No further positive blood cultures were obtained. The patient continued to improve, and the incision healed completely. Diabetic control was unsatisfactory during the first three weeks of hospitalization but was well established from then until his discharge on the fifty-fourth hospital day.

CASE 5.—F. N., a Negro woman aged 28, entered the hospital complaining of pain in the upper half of the left hemithorax. Ten days before admission she had experienced chilliness followed by a feeling of fever. These symptoms had recurred repeatedly each day afterward. After four days she had suddenly been stricken with sharp pain in the left pectoral region. Cough had then begun and had noticeably aggravated the pain. Her private physician had informed her that she had pleurisy, and sulfathiazole had been prescribed. The cough later had become productive of thick brown sputum.

The patient had been taking heroin intravenously for four months, during which time there had been a loss in weight of 50 pounds (23 Kg.). The syringe and needle used for injections had not been sterilized at any time.

On examination the patient looked acutely ill and emaciated. The temperature was 102.8 F., pulse rate 110, respiratory rate 32 and blood pressure 100/75. Both forearms were scarred along the course of the veins. There were bronchovesicular breath sounds and subcrepitant rales over the left upper lobe. The heart was normal except for a soft apical systolic murmur.

Urinalysis showed a trace of albumin. There was moderately severe anemia, and the leukocyte count was 6,400 with 75 per cent neutrophils and 25 per cent lymphocytes. Smears for malaria were negative. X-ray examination of the chest showed small areas of infiltration in the left upper lobe. Blood cultures were repeatedly positive for *Staphylococcus aureus*.

The patient lived thirty-one days after entering the hospital. Her clinical course was septic and steadily downward. She was treated with sulfamerazine without any effect on either the course or the positive blood cultures. Subsequent x-ray films of the chest demonstrated clearing of the infiltration in the left upper lobe and the appearance of numerous new areas of involvement which were interpreted as pulmonary infarcts. From time to time there was expectoration of fresh blood, but the physical findings in general were not altered except for variation in the location of pulmonary rales.

At postmortem examination the heart was not enlarged. There was acute bacterial endocarditis of the tricuspid valve, the picture in general being similar to that of the other cases. There were many small pulmonary infarcts, all of which had undergone abscess formation. There was empyema of the right pleural cavity. The spleen was moderately enlarged.

COMMENT

As far as we have been able to determine from the literature and from Dr. Edwin G. Williams of the United States Public Health Service, septicemia due to ordinary organisms must be very uncommon in narcotic addicts. In 4 of the 5 cases reported here the causative organism was *Staphylococcus aureus* and in one *Bacillus pyocyaneus*.

None of the patients used any antiseptic precaution in the self administration of the heroin. There are, therefore, several possible modes by which blood stream infection may have occurred. First, the material used may have contained pathogenic bacteria. In general, heroin used by addicts is mixed with various agents for the purpose of adding bulk. One such common adulterant is lactose, which perhaps would improve the mixture as a culture medium. Second, the equipment used in the administration of the heroin was not sterilized and was often passed from one addict to another without cleansing. Third, failure to apply an antiseptic to the skin before injection of heroin intravenously may have permitted the introduction into the blood stream of organisms inhabiting the skin. Fourth, in case 4 the source of the septicemia may have been the abscess which had developed at a site of injection. Presumably, of course, the abscess had its inception by one of the mechanisms previously mentioned. There is no way to determine definitely which of these possible modes of infection operated in these cases. However, the fact that cases 3, 4 and 5 were closely associated chronologically suggests that the heroin was contaminated. On the other hand, patients 3 and 4 were husband and wife, who used a syringe in common.

It is not particularly surprising that acute bacterial endocarditis developed in 4 of these 5 cases of septicemia. However, localization of the lesion on the tri-

cuspid valve alone in 3 of the cases is noteworthy because of its rarity. For example, in a series of 646 cases of acute bacterial endocarditis reported by Goldburgh, Baer and Lieber⁴ the tricuspid valve alone was involved in only 20 cases (3.1 per cent). In the remaining case the aortic valve alone was affected. There was no evidence of preexisting valvular disease in any of the cases.

The diagnosis of acute endocarditis was readily apparent in case 1. Manifestations of septicemia, repeatedly positive blood cultures, petechiae and the appearance of an aortic diastolic murmur indicated the existence of bacterial endocarditis of the aortic valve.

In cases of endocarditis involving the right side of the heart the diagnosis may be less apparent. In the 3 cases of this group the presence of septicemia was obvious from the clinical course and the positive blood cultures for *Staphylococcus aureus*. However, the onset of manifestations of pulmonary infarction indicated the need for discovering a source of the emboli. The absence of any such source in the peripheral veins permitted the deduction that there was right sided endocarditis. The failure to detect a murmur in any case was strong ground for concluding that the tricuspid valve was the seat of the endocarditis. There was no evidence of embolic phenomena in the systemic circulation in any of these cases, and it is interesting that in spite of the presence of staphylococcal septicemia abscesses were found only in the lungs. The diagnostic features of these 3 cases have been discussed in greater detail elsewhere.⁶

The treatment in the 4 cases of endocarditis included the use of average doses of one of the sulfonamides in each case and of penicillin in 1 case. The outcome was uniformly fatal. In case 4, in which there was a large staphylococcal abscess of the antecubital fossa and *Staphylococcus aureus* septicemia but no endocarditis, incision and drainage of the abscess, sulfamerazine and penicillin successfully controlled the infection.

SUMMARY

In 4 of 5 cases of septicemia in heroin addicts death followed the development of acute bacterial endocarditis, which in 3 instances involved the tricuspid valve alone. Three of the cases of endocarditis were due to *Staphylococcus aureus* and the fourth to *Bacillus pyocyaneus*. In the 1 case of *Staphylococcus aureus* septicemia without endocarditis, recovery occurred.

4. Goldburgh, H. L.; Baer, S., and Lieber, M. M.: Acute Bacterial Endocarditis of the Tricuspid Valve, *Am. J. M. Sc.* **204**: 319 (Sept.) 1942.

5. Hussey, H. H., and Katz, S.: Septic Pulmonary Infarction, to be published.

Mental Exhaustion from Intellectual Effort.—Bearing on this subject, I, like others of our profession, have had repeated occasion to observe the effect of overwork on gentlemen who use their brains with an expenditure of energy inconceivable to the thoughtless—men of widespread mercantile affairs, men engaged in money transactions on a large and anxious scale. The condition of such patients attested the applicability of these remarks by their mental and physical exhaustion, by their depression of spirits and by their want of self confidence. Yet, with such men, the restoration to health has been made complete by mental leisure, by "going out of town" and taking plenty of exercise in the open air, while abstaining from the real disturbing cause, their business.—Hilton, John: *Rest and Pain*, London, George Bell & Sons, 1857.

THE TREATMENT OF EARLY AND LATENT SYPHILIS

IN NINE TO TWELVE WEEKS WITH TRIWEEKLY INJECTIONS OF MAPHARSEN

A PRELIMINARY ANALYSIS OF THE RESULTS IN THE FIRST 4,823 CASES

HARRY EAGLE, M.D.

BALTIMORE

The pioneer work of Chargin, Leifer, Hyman and their associates¹ with the five day intravenous drip has stimulated a large number of clinical studies on other intensive methods of antisyphilitic treatment.² The duration of treatment has been varied from one day to twenty weeks, the frequency of injections has been varied from twice daily to twice weekly, and in some clinics artificially induced fever has been used as an adjunct to the intensified course of arsenotherapy.

As with any chemotherapeutic procedure, the three major considerations which determine the utility of these treatment schemes are their therapeutic efficacy, their toxicity and their practicability. Recent studies in experimental rabbit syphilis provide a helpful orientation to the first two of these points. The total curative dose of mapharsen was found to be more or less constant, largely independent either of the frequency of injections or of the duration of treatment.³ On the other hand, the toxicity of the drug varied directly with the method of administration. The shorter the time period over which the mapharsen was administered and the fewer the injections, the greater was its toxicity⁴ and the smaller was the margin of safety provided by a given therapeutic dose.⁵

In man also the curative dose of mapharsen has been found to be essentially the same, regardless of the method of administration.⁵ From the animal data it was therefore to have been anticipated that, the shorter the time period into which the curative dose of mapharsen was compressed, the greater would be the incidence of serious toxic reactions and death. That has been fully borne out in practice. Thus, weekly injections of 60 mg. of mapharsen represent approximately one tenth the maximal tolerated dose in animals; and, corresponding to that wide margin of safety, the mortality in man following routine weekly treatment at this dosage level has been on the order of 1:5,000 or less.⁶ On the other hand, when the total therapeutic dose of 1,200 mg. of mapharsen was compressed into five days, the calculated margin of safety⁵ was only 2.0, and the observed mortality with this schedule in man has been on the order of 1:200. Between these two extremes, schedules of intermediate degrees of toxicity, providing intermediate margins of safety.

Owing to limitations of space, tables 1 and 6 appear in reprints only. From the U. S. Public Health Service Venereal Disease Research and Postgraduate Training Center, Johns Hopkins Hospital.

Read in a panel discussion on "Intensive Therapy of Early Syphilis, with Special Reference to Arsenotherapy Either Alone or Combined with Other Agents," before the Section on Dermatology and Syphilology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1 and 2. Bibliographic titles are given in the reprints.
3. Eagle, H., and Hogan, R. B.: An Experimental Evaluation of Intensive Methods for the Treatment of Early Syphilis: II. Therapeutic Efficacy and Margin of Safety, *Ven. Dis. Inform.* **24**: 69-79, 1943.

4. Eagle, H., and Hogan, R. B.: An Experimental Evaluation of Intensive Methods for the Treatment of Early Syphilis: I. Toxicity and Excretion, *Ven. Dis. Inform.* **24**: 35-44, 1943.

5. Eagle, H., and Hogan, R. B.: An Experimental Evaluation of Intensive Methods for the Treatment of Early Syphilis: III. Clinical Implications, *Ven. Dis. Inform.* **24**: 159-170, 1943.

6. Hahn, R. D.: Antisyphilitic Treatment: Mortality Studies: Clinical, Statistical and Pathologic Analysis of Forty-Seven Fatal Reactions, *Am. J. Syph., Gonorr. & Ven. Dis.* **25**: 659-686, 1941.

necessarily result in a correspondingly intermediate morbidity and mortality (chart 1).

On the basis of the animal data there was reason to believe that a treatment schedule involving injections of mapharsen repeated three times weekly at a unit dose of approximately 1 mg. per kilogram represented a reasonable compromise between speed and safety. This schedule in animals provided a safety factor of 6 to 8.⁵ Corresponding to that large margin of safety, it was anticipated that the mortality in man would be less than 1:1,000 and that such a schedule would permit the definitive treatment of early and perhaps of latent syphilis in outpatient clinics within a period of six to twelve weeks. The clinical study was begun in October 1941 with the cooperation of hospital, state, county and municipal venereal disease clinics. The number of participating clinics gradually increased, reaching 86 as of March 1, 1944. These clinics are listed in table 1.

With the exception of those cases treated in Marine hospitals and a few other hospital clinics, all patients were treated as ambulatory outpatients. The dosage was adjusted to body weight, at first with ten different

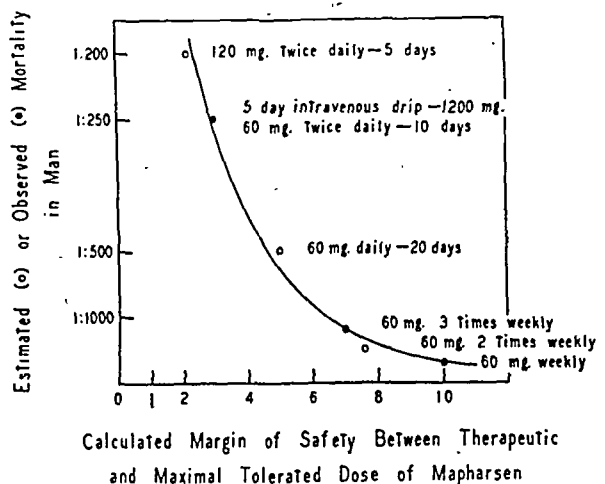


Chart 1.—Mortality of various treatment schedules in man as a function of the margin of safety, calculated from experimental data.

dosage scales, but later with five, as indicated in table 2. The average dose was 60 mg.; the maximum was arbitrarily set at 80 and the minimum at 40 mg. No distinction was made between the sexes. The duration of treatment was varied from four to twelve weeks in order to ascertain the minimum total amount of treatment which would give satisfactory results. In approximately half the clinics the patients were given weekly injections of a bismuth compound concomitant with the arsenical in order to determine the degree to which the end results would be affected by the administration of heavy metal. Although the choice of the bismuth preparation was left to the discretion of the clinic director, 80 per cent of those receiving bismuth were given the bismuth subsalicylate at an average dose of 0.2 Gm., equivalent to 0.13 Gm. of bismuth metal. The clinics were urged to do quantitative rather than qualitative serologic tests in order to permit the detection of serologic relapse in patients not yet seronegative; and it was asked that such tests be repeated at least twice during the period of treatment, and monthly thereafter. It was further requested that a spinal puncture be done three months after the completion of treatment and repeated at the end of a year if feasible.

The present preliminary report is based on the early results in the first 4,823 patients on whom treatment records were submitted for analysis. Although the proportion of patients observed for a year or longer has been small (cf. table 3), it is nevertheless believed that the method of analysis permits preliminary conclusions

TABLE 2.—Dosage Scale of Mapharsen in Relation to Body Weight of Patients Treated Three Times Weekly

Weight		Mapharsen, Mg. per Injection
Lbs.	Kg.	
- 90	- 40	40
90-120	40-55	50
120-155	55-70	60
155-185	70-85	70
185-	85-	80

TABLE 3.—Duration of Observation of 3,376 Patients with Primary and Secondary Syphilis

Weeks after beginning of treatment	<6	6-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59
Patients still under observation	3,376	2,944	2,249	1,721	1,410	1,154	942	609	358

The progressive falling off is due in part to lapse and in part to the fact that almost half these patients have been treated during the past twelve months.

with respect to therapeutic efficacy in early syphilis and that these conclusions will be modified only slightly as more patients fall into the longer observation periods.

METHOD OF ANALYSIS

As shown in table 4, the 4,823 patients treated included 290 with seronegative primary, 1,054 with seropositive primary, 2,050 with secondary and 1,190

TABLE 4.—Analysis of 4,823 Cases of Syphilis Treated with Triweekly Injections of Mapharsen

Race and Sex		A. Race, Sex and Age									
White	Negro	White	Negro	Age	<15	15-17	18-20	21-29	30-44	> 45	Un- known
♂	♀	♂	♀		68	523	1,162	2,005	938	106	20
1,282	1,301	678	1,562								
B. Diagnosis ¹											
Early Syphilis (3,384)				Latent Syphilis (1,190)				Late Secondary and Treatment Failures (159)			
Primary Seronegative	Primary Seropositive	Total	Secondary	<2 Years' Duration	>2 Years' Duration	Reinfection or Relapse	Unknown	Infectious	Recurrent	Secondary	Serorelapse
290	1,054	1,344	2,050	347	212	631	129	8	21		
¹ Fifty cases of central nervous system syphilis and 29 with infectious presenting symptoms are not included in the table.											
² 978 dark field positive, 165 dark field negative, 291 dark field not done.											
³ Including cases of both primary and secondary syphilis.											
C. Amount of Treatment Received											
Number of Mapharsen Injections	Number of Patients	Total Mapharsen Mg./Kg.	Without Bismuth	With Bismuth	Total						
- 9	384	14	355	400	755						
10-14	367	15-20	201	620	821						
15-20	692	21-26	918	1,388	2,306						
21-26	2,547	27-	145	676	721						
27-	803	4	47	133	180						

4. Weight unknown.

with latent syphilis. There were 151 patients previously treated for early syphilis and now diagnosed as presenting infectious relapse or serologic relapse, and 8 with late recurrent syphilis. Forty per cent of the total were white and 53 per cent were male. The amounts of treatment received, expressed both as the number of injections and as the total milligrams per kilogram of body weight, are listed in table 4.

In evaluating the therapeutic results in cases of primary and secondary syphilis, the following types of case were adjudged treatment failures: infectious relapse, clinical evidence of central nervous system involvement, positive Wassermann or flocculation test in the spinal fluid without clinical symptoms, serologic relapse and cases presenting a persistently positive blood test at a more or less stationary level one year after the beginning of treatment. Cases which were strongly suggestive of reinfection rather than relapse were nevertheless considered treatment failures. Cases were adjudged serologic relapse (a) if the blood tests

proportion adjudged seronegative, clinically well and "cured" would have had a positive fluid.

The methods used in the calculation of the cumulative percentage of treatment failure, and the cumulative percentage of patients becoming and remaining seronegative, are illustrated in table 5.

TOXICITY

The toxic reactions observed in the entire group of 4,823 patients are summarized in table 6, grouped in three categories. The minor subjective reactions of nausea, vomiting, malaise or headache occurred in 16

TABLE 5—Method Used in the Calculation of the Cumulative Percentage of Treatment Failure and "Cure"

(Patients with primary and secondary syphilis who received 21 mg./Kg. mapharsen or more, with concomitant injections of bismuth)

	Weeks after beginning of treatment	-6	0-7	8-9	10-11	12-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69
(1)	No. patients under observation	1,341	1,225	1,300	1,079	913	789	623	505	375	291	215	100	121	55
(2)	No. treatment failures observed at indicated time														
(3)	Apparent						1	3	2	1	5		1	5	1
(4)	Apparent						0.13	0.48	0.4	0.27	1.72		0.6	4.13	1.82
(5)	from (4)						99.87	99.52	99.6	99.73	98.28	100	99.37	95.87	98.18
(6)	Cumulative						99.87	99.39	98.99	98.72	97.02	97.02	96.41	92.43	90.75
(7)	No. becoming seronegative	144	61	78	76	99	111	61	27	25	9	6	4	5	1
(8)	Apparent per cent becoming seronegative	10.73	4.7	6.0	7.04	10.85	14.2	9.90	5.4	6.67	3.09	2.79	2.30	4.12	1.82
(9)	Per cent becoming seronegative, corrected	10.73	4.7	6.0	7.04	10.85	14.2	9.89	5.9	6.6	3.0	2.71	2.4	3.98	1.67
(10)	from (9)	10.73	10.41	21.47	28.47	59.32	33.64	63.53	68.92	75.52	78.7	81.28	83.71	87.69	89.9
(11)															
(12)	Apparent per cent above failures, referred to total patients under observation (1) as 100						2	2	1	5				3	1
(13)	Corrected per cent above failures, referred to total patients under observation (1)						0.32	0.40	0.27	1.7				2.45	1.82
(14)	from (13)						0.32	0.4	0.27	1.67				2.41	1.81
(15)	Cumulative per cent becoming and remaining seronegative						6.82	74.53	75.91	78.72	81.05	82.72	82.75		

1 Figures in these columns of dubious quantitative significance because of small numbers of patients still under observation

TABLE 7—Effect of Amount of Mapharsen Treatment (Total Mg./Kg.) on Number of Treatment Failures in 3,376 Cases of Primary and Secondary Syphilis

	Patients Receiving Mapharsen Alone					Patients Receiving Bismuth Plus Mapharsen				
	Total	<15	15-20	21-26	Total Mapharsen	Dosage, Mg./Kg.	<15	15-20	21-26	27
	3,376	297	174	368	94	1,135	327	473	905	425
	24	21	24	53	28	23	7	22	27	26
87	19	6	1	1	3	61	3	14	6	3
81	8	1	4	6	62	1	11	5	2	19
12	5	1	4	10	1	1	1	1	1	2
14	5	2	2	7	7	4	3	3	1	7
14	7	2	2	12	12	2	1	1	1	2
...	208	44	12	84	9	152	4	31	14	5
	6.2	14.8	9.0	14.8	9.6	13.4	6.6	1.5	1.1	2.6
Comment	In patients not receiving bismuth there was a uniformly high incidence of treatment failure. Even large amounts of mapharsen alone were not as effective as moderate amounts of mapharsen supplemented by 5 to 8 injections of bismuth. In patients receiving bismuth there were fewer treatment failures, and in proportion to the total amount of treatment received.									

1. Eighty per cent of patients receiving bismuth were given the sub-salicylate, once weekly, in average dose of 0.2 Gm. (0.13 Gm. of bismuth metal). Total number of bismuth injections was approximately one-third of the total mapharsen dosage in milligrams per kilogram. For the corrected cumulative percentage of treatment failures and "cures" in relation to the method of treatment, compare charts 1, 2 and 3.

2. These figures are of relative and not of absolute significance, since they refer the failures to the original number of patients treated and do not take into consideration the fact that the number of patients under observation fell off steadily after treatment was completed.

reverted to positive after having been negative for a significant period of time, and remained so, or (b) if the serum tests, without ever having become negative, showed a definite and continuing upward trend in the quantitative reagin titer. The fact that in only 30 per cent of the cases of early syphilis was a spinal puncture done three months or longer after beginning treatment is not believed to affect the apparent end results materially. Every one of the patients with a positive spinal fluid or clinical evidence of neurosyphilis had a positive serum test. It follows that, of those patients who did not have a spinal puncture, only a negligible

per cent of the patients, and approximately 1.5 times more often in women than in men. The incidence of these reactions differed widely among individual clinics, and psychologic factors as well as the varying quality of medical care undoubtedly contributed to that varying frequency. In 23 patients, or 1 in every 210 treated, the repetition and severity of these ordinarily minor complaints made it necessary to discontinue treatment.

In 106 of the patients a syndrome was observed suggestive of sensitization to mapharsen and resembling that observed in some patients receiving a sulfonamide compound. The symptoms varied from patient to

patient and occurred in varying combination. In order of decreasing frequency they consisted of fever, rash, vomiting, headache, conjunctivitis and photophobia, and facial edema. Most of these patients recovered completely in forty-eight to seventy-two hours. In 24 of 62 patients tested in that respect soon after recovery.

This tendency for serious reactions to occur in women is of particular interest in relation to the treatment of syphilis in the armed forces. In the 2,583 men represented in the present study no deaths occurred, there were 14 serious reactions, including 11 cases of jaundice, and treatment had to be discontinued for any reason in a total of only 48.

THERAPEUTIC RESULTS IN EARLY SYPHILIS

When the mapharsen was given alone, without bismuth, the results were uniformly poor, regardless of the amount of arsenical administered. The number of observed failures per hundred patients treated differed but little in patients receiving a total of less than 15, 15 to 20, 21 to 26 or 27 or more mg. of mapharsen per kilogram (15, 9, 15 and 10 per cent treatment failures respectively, cf. table 7). However, when bismuth was given along with the mapharsen the results were consistently better, and the optimum results far exceeded those it was possible to attain with mapharsen alone. In patients receiving a total of 15 to 20, 21 to 26 and 27 or more mg. of mapharsen per kilogram plus an average of six, eight and ten injections of bismuth respectively, the incidence of observed treatment failures was 6.6, 1.5 and 1.1 per cent respectively.

These figures are of relative rather than absolute significance because of the large proportion of patients who disappeared from observation. A statistically more reliable comparison is afforded by the cumulative percentage of treatment failure and the cumulative percentage of "cure" calculated by the method illustrated in table 5. The results are in complete agreement with those obtained by the crude method of analysis that has been outlined. As shown in charts 2 and 3, mapharsen alone (the open circles and triangles in charts 2 and 3) gave uniformly poor results.

The addition of an average of only five injections of bismuth to the smaller amount of mapharsen (less than

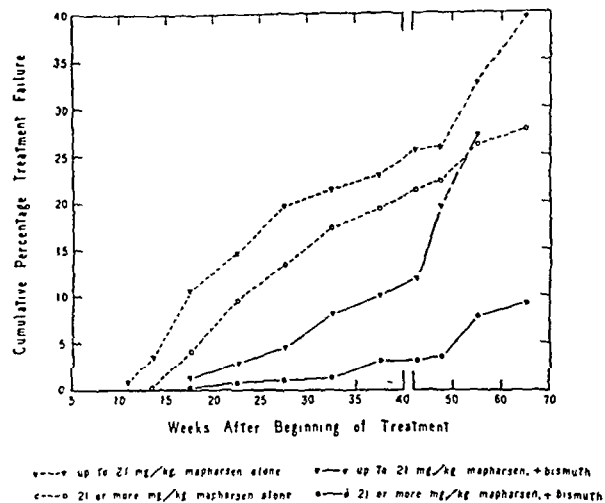


Chart 2.—Cumulative percentage of treatment failure in patients treated triweekly, in relation to the total dose of mapharsen and bismuth.

actual sensitization to mapharsen was demonstrated in that small doses precipitated the same syndrome; and in a total of 54 patients, or 1 in every 90 patients treated, it was necessary to discontinue arsenical treatment. It is of interest that 70 per cent of these reactions occurred in the second to fourth week of treatment and 60 per cent in the second week, between the eighth and the fourteenth day of treatment. The time period, coupled with the high frequency of an associated toxic rash, suggests a close relationship of this syndrome to so-called erythema of the ninth day.

Serious toxic reactions occurred in a total of 39 patients. They consisted of 2 cases of toxic encephalopathy (1:2,400), 7 cases of arsenical dermatitis (1:700), 4 of nephritis (1:1,200), 5 of blood dyscrasia (1:950) and, as the most frequent complication, 21 cases of jaundice (1:250). As with the "sensitization syndrome," 40 per cent of these serious reactions occurred in the second week of treatment and 75 per cent in the second to the fourth week. In general, toxic reactions occurred most frequently during the second week of treatment; beyond that period there was progressively decreasing likelihood of a serious toxic complication.

There were four deaths in the entire series of 4,823 patients: 2 cases of nephritis, 1 of toxic encephalopathy and 1 of jaundice, all occurring in the second to fourth week of treatment. This mortality of 1:1,200 is reasonably close to that anticipated on the basis of animal data but should be further qualified in that two, and perhaps three, of these deaths may have been preventable. With reasonably good medical care the mortality on the triweekly schedule may therefore be 1:2,000 or less rather than 1:1,200.

Unlike the mild reactions to mapharsen, and unlike the syndrome suggestive of sensitization to mapharsen, serious toxic reactions tended to occur in women, in young patients and in Negroes. Thus, all four deaths were in Negro women, 3 of whom were under 18.

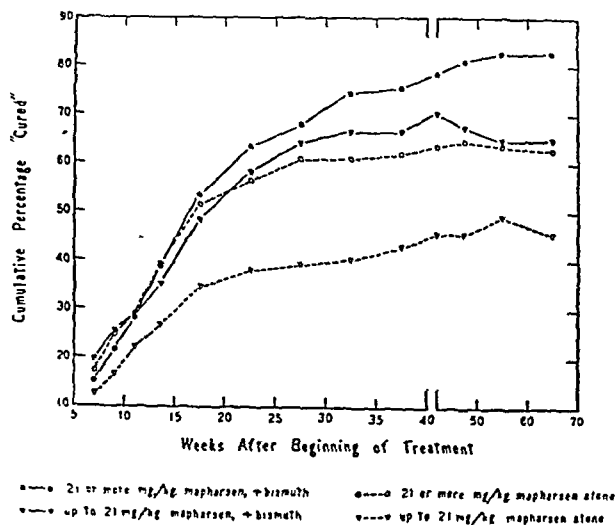


Chart 3.—Cumulative percentage of "cure" in patients treated triweekly, in relation to the total dose of mapharsen and bismuth.

21 mg. per kilogram) significantly decreased the percentage of definite failure and increased the percentage of "cure" in fifty to sixty weeks from 49 to 65. When an average of nine injections of bismuth was added to the larger amount of mapharsen (21 mg. per kilogram or more) the cumulative percentage of treatment failure seventy weeks after beginning treatment fell to 9.3, and

82 per cent of the patients were seronegative and "cured," with the remainder of the cases still pending (closed circles in charts 2 and 3).

In summary, at least in the triweekly schedule, and perhaps in other intensified forms of arsenotherapy as

TABLE 8.—Incidence of Observed Treatment Failures¹ in Relation to Amounts of Bismuth and Mapharsen Received

Total Mapharsen, Mg./Kg.	Incidence (%) of Treatment Failure in Patients Receiving Indicated Number of Bismuth Injections			
	None (796)	1-4 (53)	5-8 (881)	9 and over (879)
15-20.....	9.1	.. ²	7.3	2.6
21-26.....	15	..	1.8	1.3
27 and over.....	9.6	..	...	1.1
Total.....	13.2	8±	4.0	1.4

1. Although the actual cumulative percentage of treatment failure was several times the apparent incidence as listed above, these figures do reflect the relative efficacy of the various treatment schedules.

2. Results not significant because of small number of patients.

well, mapharsen should be supplemented by bismuth for optimum results. In the absence of heavy metal a relatively small amount of mapharsen (up to 20 mg. per kilogram, averaging a total of 800 mg.) "cured" half of the patients, and even twice that amount, an

mapharsen per kilogram plus approximately six injections of bismuth). The two drugs are apparently not merely additive but actually synergistic in their therapeutic effects. This suggests that they may exert their spirocheticidal action by affecting different vital functions of the organism.

The question may be raised as to whether the striking adjuvant role of bismuth may not be more apparent than real. It is conceivable that the deposit of insoluble bismuth subsalicylate serves merely to postpone infectious or serologic relapse. Although this is unlikely, and although the rate at which patients failed gave no indication that such was the case, several years' observation will be necessary before this possibility can be dismissed from consideration.

MISCELLANEOUS CONSIDERATIONS

Type of Failure.—As indicated in table 6, infectious relapse and serologic relapse accounted for 43 and 40 per cent of the observed treatment failures. A large proportion of the serologic relapses were diagnosed in patients who had never been seronegative, by virtue of a sustained and continuing rise in the serum reagin content, quantitatively titered. Central nervous system involvement accounted for an additional 13 per cent, half of these being asymptomatic; and 7 per cent of the

TABLE 9.—Analysis of Treatment Failures in 908 Cases of Primary and Secondary Syphilis Treated with a Total of 21-26 Mg. of Mapharsen per Kilogram and Concurrent Injections of Bismuth

	Totals	Race and Sex				Initial Serologic Titer ¹				Diagnosis			Duration of Treatment, Days		
		White		Negro		0	1-7	8-31	32-	Sero-neg. Primary	Sero-pos. Primary	Secondary	-68	59-76	77-
		♂	♀	♂	♀										
Number of.....	908	244	244	99	321	75	76	131	248	75	282	551	335	315	258
Mean period.....	23	16	24	28	25	..	..	..	..	..	..	..	..	..	..
Number of f.....	14	6	3	2	3	1	2	1	3	1	2	11	5	6	3
Apparent incidence treatment failures	1.6	2.4	1.2	2.0	1.0	1.3	2.6	0.8	1.2	1.3	0.7	2.0	1.5	1.9	1.2

Comment: No demonstrable correlation between the incidence of observed treatment failure and either race, sex, initial serologic titer or the duration of treatment. As in the entire series, fewer failures were observed in seropositive primary syphilis than in secondary syphilis. There was certainly no evidence that the latter has a more favorable prognosis because of a putative immunity.

1. Titer = highest dilution of serum giving a definitely positive result.

average total of approximately 1,600 mg., "cured" less than two thirds. However, with simultaneous weekly injections of bismuth (0.2 Gm. of bismuth subsalicylate), triweekly injections of mapharsen at individual doses of approximately 1 mg. per kilogram (40 to 80 mg. per injection) continued for nine to twelve weeks will apparently "cure" at least 80 per cent, and probably closer to 90 per cent, of cases of early syphilis.

Relative Importance of Mapharsen and Bismuth.—Given the fact that the simultaneous administration of bismuth so materially affected the results attained by the triweekly administration of mapharsen, the question arises as to the relative importance of the arsenical and of the bismuth. The data of table 7 provide a partial answer to that question. When both mapharsen and bismuth were used, an increase in the amount of either drug led to more favorable results. A relatively small amount of mapharsen (15 to 20 mg. per kilogram) supplemented by nine injections or more of bismuth gave results comparable to those achieved by larger amounts of mapharsen with smaller amounts of bismuth. In that sense the drugs were mutually supplementary. However, even the largest amount of mapharsen alone (27 or more mg. per kilogram, averaging 30) was less effective than relatively small amounts of mapharsen and bismuth used in conjunction (15 to 20 mg. of

failures were of patients whose serologic findings were positive at a stationary level one year after the beginning of treatment. The degree to which the central nervous system failures represented cases of central nervous system involvement at the time treatment was begun is an open question.

Outcome as Influenced by Stage of Infection.—On the basis of previous studies, the prognosis of early syphilis is generally considered better in secondary syphilis than in the seropositive primary stage.⁷ In explanation it is usually assumed that the patient with secondary syphilis has had time to develop a certain degree of immunity. However, the present study gave no indication of a more favorable prognosis in secondary syphilis.

Relapsing and Recurrent Syphilis.—In patients with previously treated early syphilis who had relapsed, the number of treatment failures significantly exceeded those obtained in previously untreated syphilis, but only when mapharsen was given alone, without bismuth. In those patients who received mapharsen plus bismuth, the prognosis was apparently no less favorable than in previously untreated cases. However, the number of

7. Moore, J. E.: *The Modern Treatment of Syphilis*, ed. 2, Springfield, Ill., Charles C Thomas, Publisher, 1941, pp. 581-588.

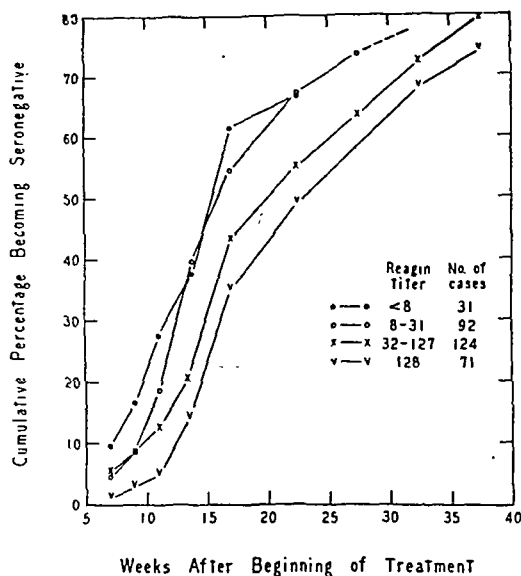
patients was small, and further experience and observation may alter the picture unfavorably (table 10).

Rate of Serologic Reversal.—Although, as shown in table 9, the initial serologic titer had no effect on the prognosis of early syphilis, it did materially affect the time required for serologic reversal. As is shown in chart 4, in a group of patients who received similar amounts of treatment (21 to 26 mg. of mapharsen, plus bismuth), those with a low reagin titer attained seronegativity considerably faster, on the average, than those with initially high titers. It is of interest that the rate at which the serum reagin titer fell, and the rate at which patients became seronegative, were the same in this semi-intensive schedule of treatment as in the traditional method of weekly injections.

The question comes up as to the relative efficacy of treatment when the same total dosage of mapharsen was spread over a longer time period, either because treatment was irregular or because the individual dose was smaller than that indicated in table 2. On the basis of the animal data³ one would have anticipated little or no difference in the end results; and that has been the experience in the present study. As shown in the last section of table 9, in patients receiving similar total amounts of treatment (21 to 26 mg. of mapharsen per kilogram), all of whom also received bismuth, there was no significant difference in the number of observed failures if treatment was completed in less than fifty-eight days (averaging fifty-four), in fifty-eight to seventy-seven days (averaging sixty-six) or in more than seventy-seven days (averaging eighty-one). Within these limits, occasional lapses in treatment or the use of e. g. a biweekly instead of a triweekly schedule had no effect on therapeutic efficacy. The important consideration was the total amount of drug received rather than the intensity or regularity of its administration.

Latent Syphilis.—In 945 of the 1,190 cases of latent syphilis included in the present study, no previous treatment had been given and they were diagnosed on serologic grounds alone. In 279 of these the disease was believed to be of less than two years' duration. In this presumably most favorable group, 99 were given the schedule of treatment found to be most effective in early syphilis (more than 21 or more mg. of mapharsen

rather permanent freedom from symptoms, and since a relatively small amount of standard weekly treatment apparently suffices for that purpose,⁸ there is every reason to anticipate that an intensive schedule of treatment which is adequate for early syphilis will be equally satisfactory for the treatment of latent syphilis. Because



316 cases of secondary syphilis, similarly treated
(21-26 mg./kg. mapharsen + bismuth)

Chart 4.—Rate at which patients became seronegative, in relation to the initial serum reagin titer.

of the generally favorable prognosis of latent syphilis, even with little or no treatment, many years' observation of a large group of patients will be necessary to establish this point.

SUMMARY

1. A total of 4,823 patients, including 3,394 cases of primary and secondary, 1,190 of latent and 159 of recurrent or relapsing syphilis, have been treated with triweekly injections of mapharsen at approximately 1 mg. per kilogram per injection, with a maximum of 80 mg. and a minimum of 40. Two thirds of the patients were given concomitant weekly injections of a bismuth compound, usually bismuth subsalicylate (0.2 Gm.).

2. Treatment had to be interrupted because of toxic reactions in a total of 106 patients. Thirty-nine of these were serious reactions, with jaundice the most common complication. Four patients died. It is believed that at least two of these deaths were preventable and that the mortality of the triweekly schedule is on the order of 1:2,000. The incidence of toxic reactions was highest in young Negro women, and there were no deaths in the 2,583 men.

3. Triweekly injections of mapharsen alone, without bismuth, gave uniformly poor therapeutic results, regardless of dosage.

4. Triweekly injections of mapharsen in conjunction with weekly injections of bismuth proved highly effective. In patients receiving an average total of 1,600 mg. (21 mg. per kilogram or more) plus an average total of nine injections of bismuth, the cumulative percentage of treatment failure was 9.3 and the cumulative percentage of "cure" fifty to sixty weeks after the beginning of treatment was 82 per cent. A decrease in either mapharsen or bismuth to less than these amounts resulted in a higher proportion of treatment failure.

TABLE 10.—The Relative Incidence of Treatment Failure in Relapsing or Recurrent Syphilis, Compared with Previously Untreated Early Syphilis

	Primary and Secondary Syphilis		Infectious Relapse, Serologic Relapse and Recurrent Syphilis	
	Without Bismuth	With Bismuth	Without Bismuth	With Bismuth
Number of patients.....	1,135	2,241	89	70
Average period of observation.....	28	21	33	26
Number of failures.....	152	56	21	2
Incidence of apparent failure, %...	13.4	2.5	23.6	2.8

Comment: In patients who received only mapharsen, the relapsing group gave significantly more failures: In patients who received bismuth as well as mapharsen there was no significant difference in the prognosis of recurrent or relapsing syphilis and previously untreated cases of early syphilis.

per kilogram, with simultaneous weekly injections of bismuth). Of these only 25 had become seronegative during a varying period of observation. This is consistent with the results obtained with routine standard methods of treatment.⁸ However, since the goal of treatment in latent syphilis is not seronegativity but

S. Diecker, T. H.; Clark, E. G., and Moore, J. E.: Long-Term Results in the Treatment of Latent Syphilis. *Am. J. Syph., Genor. & Ven. Dis.* 28: 1:26, 1944.

5. Although these results are tentative, based on the prolonged observation of as yet a small proportion of the total patients treated, it is believed that triweekly injections of mapharsen at approximately 1 mg. per kilogram, combined with weekly injections of 0.2 Gm. of bismuth subsalicylate and continued for nine to twelve weeks, will probably "cure" 85 to 90 per cent of cases of early syphilis.

6. (a) The initial reagin titer affected the rate at which seronegativity was obtained but did not affect the ultimate percentage "cured." (b) Within fairly wide limits (fifty-four to eighty-one days) the total duration of treatment also had no effect on the end results. Within that time period occasional lapses in treatment or smaller individual dosages could be ignored, provided the patient eventually received the scheduled total amount of drug. (c) With equal amounts of treatment, secondary syphilis gave significantly more treatment failures than did seropositive primary syphilis.

7. The efficacy of this schedule in the prevention of congenital syphilis, and its efficacy in latent syphilis, are under continued study.

INTENSIVE ARSENOTHERAPY

A. BENSON CANNON, M.D.

JEROME K. FISHER, M.D.

JUAN J. RODRIGUEZ, M.D.

GUILA F. BEATTIE, M.D.

AND

EUGENIA MAECHLING, PH.D.

NEW YORK

We are presenting a report of 332 cases of early syphilis treated in the past three years with massive doses of arsphenamine by the syringe method, the treatment period being five to six days. Arsphenamine¹ was chosen because of our experience in the rapid healing of syphilitic lesions and the spectacular cures we had witnessed with this drug in early syphilis when other arsenicals had failed, and again because of the excellent results we had obtained in the treatment of early syphilis at the Vanderbilt Clinic over a period of some twelve years with this arsenical. Such observations encouraged us to think that some one should evaluate this drug in an intensive treatment program of early syphilis, i. e. the five day treatment.

We were prompted to undertake this study by the encouraging results of Leifer, Chargin and Hyman,² who treated 382 patients by the intravenous drip method with neoarsphenamine and mapharsen. They reported a completely satisfactory course in 81 per cent of their cases. Further study was carried on by various investigators under this plan or modification of Chargin's

technic. Rattner³ used mapharsen by the intravenous drip method in his series. Schoch and Alexander⁴ used mapharsen by the syringe method daily over periods of two to four weeks. Of 103 patients they followed for six to eighteen months, 77 per cent are in a satisfactory condition. Shaffer⁵ used mapharsen in his series of 430 patients. Cole,⁶ including the results of his own work, has summarized the studies of these and other investigators, including a discussion of some work done by Dr. Rattner subsequent to that mentioned and not reported elsewhere.

SELECTION AND CARE OF PATIENTS

All patients treated were men between the ages of 15 and 64 years, chiefly young, healthy men. One patient had active pulmonary tuberculosis, several had hypertension, 1 had a history of jaundice and a number had various skin eruptions other than syphilitic. Several were obese, and a few were thin and emaciated. All these seemingly defective patients were considered poor risks, but they tolerated the treatment as well, apparently, as the otherwise healthy individuals. Two thirds were Negroes. Most of the cases were supplied by the board of health.

All patients were hospitalized for treatment. The ward was under constant nursing care day and night, and a team of physicians gave the treatments, made all tests and closely observed each patient while in the hospital. The injections were given at three to four hour intervals during the daytime.

Every patient had a complete history and physical examination on admission. Two hundred and ninety-six had positive dark fields, and these dark field examinations were repeated daily until they were negative. Sixty-one cases were seronegative. Titrated blood Wassermann reactions were done on patients entering the ward and before discharge. Only 19 were found to have positive spinal fluid Wassermann reactions. These spinal fluid examinations were repeated at the completion of treatment. The blood and platelet counts were within normal limits. These counts were repeated after completion of the course of treatment. Albuminuria was present in 7 cases on admission. Urinalyses were done daily on all patients during the time of treatment. Eighty-nine cephalin flocculation reactions were slightly to strongly positive on admission and became negative in one week to several months following discharge from the hospital. Dr. Franklin Hanger,⁷ who has made a study of postarsphenamine liver damage and in whose laboratory the latter tests were done, stated (in a personal communication) that these positive reactions before treatment possibly signified liver damage from syphilis. The serum bilirubin and the blood urea nitrogen were found to be within normal limits on admission. These and the cephalin flocculation reactions were repeated when indicated. Frei and Ducrey tests and urethral cultures were done on all patients. Fifty-nine patients were found to have a slightly to a strongly positive Frei test when read at forty-eight hours. Sixty-nine had a

The beds in the ward were lent by the Department of Medicine. Dr. Franklin M. Hanger, associate professor of medicine, did all of the functional liver tests.

From the Department of Dermatology, Columbia University College of Physicians and Surgeons, and the Presbyterian Hospital.

Dr. Walter W. Palmer, professor of medicine, and Dr. J. Gardner Hopkins, professor of dermatology, served in an advisory capacity.

Read in a panel discussion on "Intensive Therapy of Early Syphilis, with Special Reference to Arsenotherapy Either Alone or Combined with Other Agents," before the Section on Dermatology and Syphilology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Cannon, A. B.: Optimal Treatment for Early Syphilis Based on a Twenty Year Trial of Arsphenamine, Bismuth and Mercury Preparations. *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 155, 1937.

2. Leifer, W.; Chargin, L., and Hyman, H. T.: Massive Dose Arsenotherapy of Early Syphilis by Intravenous Drip Method. *J. A. M. A.* 117: 1154 (Oct. 4) 1941.

3. Rattner, H.: Five Day Treatment of Syphilis, *Illinois M. J.* 51: 29, 1942.

4. Schoch, A. G., and Alexander, L. J.: Short Term Intensive Arsenotherapy of Early Syphilis: Preliminary Report, *Am. J. Syph., Gonorr. & Ven. Dis.* 25: 607, 1941; Intensive Arsenotherapy of Early Syphilis: Follow-Up Report on the Ten Day Syringe Method of Treatment, *Arch. Dermat. & Syph.* 46: 128 (July) 1942.

5. Shaffer, L. W., and Salcho, P. T.: Report of Social Hygiene Division, Detroit Department of Health, September 1942.

6. Cole, H. N.; Heisel, E. B., and Stroud, G. III: Intensive Methods of Treating Syphilis, *J. A. M. A.* 123: 253 (Oct. 2) 1943.

7. Hanger, F. M., Jr., and Gutman, A. B.: Postarsphenamine Jaundice, *J. A. M. A.* 115: 263 (July 27) 1940.

lightly to a strongly positive Ducrey skin test at forty-eight hours, and 21 had positive urethral cultures for gonorrheal organisms. No evidence of syphilitic involvement was found on x-ray examination of the heart or aorta. Electrocardiograms were done on the first half of the series. No noteworthy abnormalities were discovered. Rectal temperature, pulse rate and respiration were recorded on each patient every four hours.

A record was kept of the time required for spirochetes to disappear from surface lesions, of the healing of lesions, of the disappearance of glands and of all reactions to treatment.

After discharge from the hospital the patients were followed weekly in the clinic, where physical examinations and titrated blood Wassermann reactions were done. After the initial period of six weeks the patients were followed monthly.

TREATMENT PLAN

Our procedure consisted in giving arsphenamine in 2 per cent solution by the syringe method three to four times daily for five to six days, depending on the particular variation of our plan. The total dosage ranged from 1.5 Gm. in the beginning of the experiment to

seventh patient, so it was decided that the amount of arsenic could be increased. In order to do this the treatment was extended to six days instead of five, with a corresponding increase in the amount of arsphenamine in each weight group.

Plan Variation 2.—This increase gave the light weights a total of 1.8 Gm., the middle weights 2.55 Gm. and the heavy weights 3.45 Gm.

Forty cases were treated in this group. Sixty per cent had negative dark fields after one day's treatment, 83 per cent were negative after the second day and 95 per cent were negative after the third day. One patient was dark field positive for as long as five days. The reactions remained mild, except for the second case of encephalitis, the fifth patient treated under this new scheme. It soon became evident that some radical change must be made in the treatment program in order to hasten the disappearance of spirochetes from the lesions and to prevent mucocutaneous relapses.

Plan Variation 3.—The first radical departure from the original treatment program was to give the largest doses on the first day and gradually diminish the amount toward the end of the treatment. We gave the injections four times a day and increased the amount

TABLE 1.—Plan Variations in the Treatment with Arsphenamine

Plan Variation	Number of Cases Treated	Number of Days Treated	Number of Injections per Day	Total Amount Arsphenamine Given 1st Day (Gm.)	Total Amount Arsphenamine Given Last Day (Gm.)	Total Amount Arsphenamine Given in the Course		
						Light Weight 100 Lb. to 135 Lb. (Gm.)	Medium Weight 135 Lb. to 165 Lb. (Gm.)	Heavy Weight 165 Lb. to 220 Lb. (Gm.)
1	47	5	3	0.3 to 0.45	0.3 to 0.6	1.5	2.1	2.85
2	30	6	3	0.3 to 0.45	0.3 to 0.6	1.8	2.55	3.45
3	60	6	4	0.45 to 1.0	0.2 to 0.3	2.0	2.60	3.45
4	103	6	4	0.6 to 1.0	0.4	3.0	3.0	3.6
5*	27	4*	4*	1.0	1.0	4.0	3.0	4.4
6	35	6	4	1.0	0.4	3.4	4.0	4.4
7	37	6	4	1.0	0.4	3.2	3.6	4.0

* Plan 5 consisted in giving 1.0 Gm. of arsphenamine in four divided doses a day on three alternate days.

4.4 Gm. in the latter part of the treatment program. As arsphenamine had never been used in the five day treatment program, we began cautiously with small doses. Experience showed that the reactions were chiefly of a mild sort, so we increased the number of injections from three to four times a day, and the number of days from five to six.

VARIATIONS OF TREATMENT PLAN

We employed seven different treatment plans (table 1), each new plan having been worked out after a study of the results of the preceding one. The dosage was gaged according to the weight of the patient, each group being divided into light weight (100 to 135 pounds, or 45 to 61 Kg.), medium weight (135 to 165 pounds, or 61 to 75 Kg.) and heavy weight (165 to 220 pounds, or 75 to 98 Kg.), so that the light weight received a total of 1.5 Gm., the middle weight 2.1 Gm. and the heavy weight 2.85 Gm. of arsphenamine, given three times a day for five days. The dose was increased each day.

Forty-seven patients were treated under this plan. At the end of the first day's treatment, 52.5 per cent of the patients had negative dark fields. Two required four days before their dark fields became negative. Mucocutaneous relapses with positive dark fields began to appear. It quickly became evident that this plan had proved a failure. The reactions had been of an exceedingly mild type except for an encephalitis in the forty-

of arsphenamine to 2.0 Gm. for the light weights, 2.6 Gm. for the middle weights and 3.45 Gm. for the heavy weights. We were prompted to begin the treatment with large doses on the first day because of the lack of serious reactions and of the patient's good general condition at this period of treatment. Furthermore, we were convinced that the greater the initial dosage in the first day or two of treatment the more favorable would be the result. Large doses in the beginning had the added advantage that, should the treatment have to be discontinued because of reactions, the patient would already have received a substantial part of his treatment in the first two days, virtually half the total amount of arsphenamine planned for the course.

Of the 60 patients treated under this third plan, 96 per cent were negative on dark field examination after the first day of treatment and 100 per cent were negative at the end of the second day, a decided improvement over the other two plans. The serologic responses were most encouraging, a number of patients becoming negative and others showing pronounced reduction in the intensity of the reactions. While frequency and intensity of all the reactions were somewhat increased, especially the initial rise in temperature, they were not serious. Even though the individual had a Herxheimer reaction with a temperature of 104.2 F., the injection of arsphenamine was given. The next morning the patient's temperature would be normal and he would be none the worse.

After six months infectious relapses began to make their appearance. A study was then made of all cases treated to date in each variation of our plan of treatment, and it was observed that no patient who had received as much as 3.0 Gm. of arsphenamine had suffered a relapse. It appeared that if each patient could be given a minimum of 3.0 Gm. that might be the answer to our problem.

Plan Variation 4.—This was devised whereby the light weight and middle weight groups each received 3.0 Gm., and the heavy weight group 3.6 Gm. One hundred and three patients were treated in this plan. All except 1 had a negative dark field after the first day of treatment. While the incidence of initial febrile reactions remained about the same as in the previous group treated under plan 3, there was a 6 per cent increase in toxic erythema. Optimism over this plan of treatment was soon dispelled by the appearance of mucocutaneous relapses in spite of the minimum 3.0 Gm. dose that had been given.

TABLE 2.—Time Required for Dark Fields to Become Negative

Plan Variation	Dark Field Positive Cases	Negative After 1st Day, per Cent	Negative After 2d Day, per Cent	Negative After 3d Day, per Cent	Negative After 4th Day, per Cent	Negative After 5th Day, per Cent
1	40	52.5	90.0	95.0	100.0	
2	38	60.5	83.7	95.2	92.9	100.0
3	50	94.0	100.0			
4	26	98.9	100.0			
5	27	100.0				
6	18	100.0				
7	37	100.0				

TABLE 3.—Outcome of Treatment

Number of cases	332
Observed 6 months to 3 years	178
Observed 9 to 11 months, outcome pending (2%)	3
Clinically and serologically negative (6%)	118
Unsatisfactory outcome (3%)	57
Cutaneous relapses with positive dark field (Negative blood Wassermann before cutaneous relapse—24)	56
Serorelapse after becoming seronegative	9
Did not become serologically negative in 12 months	12
Failed to become serologically negative sometime during observation regardless of outcome	27

Plan Variation 5.—Examination of the blood arsenic reports done in the cases showed a sharp rise in the arsenic level on the second day and a tendency toward a more gradual rise on the last days of the treatment. By giving 1.0 Gm. in four divided doses every other day for a total of 3.0 Gm. in five days, we thought that the intervening day of rest would allow for the excretion of sufficient amounts of arsenic to maintain the blood arsenic at a more even level. All 27 patients treated under this plan were middle weights. All dark fields were negative at the end of the first day's treatment and there was a very satisfactory serologic response, but even though we have followed only 13 patients for six months we have had 3 mucocutaneous relapses. There was an increase both in initial rise in temperature of 16 per cent of the patients and in secondary rise in temperature of 10 per cent.

Plan Variation 6.—Although it was apparent from the increased number of reactions that we were approaching the highest total amount of arsenic that an individual could tolerate in six days, we decided to make an increase in the amount of arsphenamine to 1.0 Gm. the first day for each patient and gradually

reduce the dose toward the end of treatment. In this plan the light weights received a total of 3.4 Gm., the middle weights 4.0 Gm. and the heavy weights 4.4 Gm. in six days. Eighteen patients were treated according to this outline. All dark fields were negative by the completion of one day's treatment. Of the 8 patients that we have followed for at least six months, no relapses have occurred. This group has given the best clinical and serologic results of any so far treated, but at a cost of great increase in reactions. Toxic erythemas occurred in 55.5 per cent of the patients, secondary fevers in 89 per cent and toxic neuritis in 39 per cent. Although not severe, these reactions have been so frequent as to cause us to make a reduction in the dosage.

Plan Variation 7.—The last plan variation, 7, called for 1.0 Gm. of arsphenamine the first day in all groups of patients. For the light weight group we gave a total of 3.2 Gm., the middle weight group 3.6 Gm. and the heavy weight group 4.0 Gm. Thirty-seven patients were treated in this group. All dark fields were negative by the end of the first twenty-four hours of treatment. Although only 2 patients in this group were followed for six months, 1 had a mucocutaneous relapse on the eighty-first day after completion of the treatment.

OUTCOME OF TREATMENT

The time required for the disappearance of spirochetes from the lesions varied according to the plan of treatment and the amount of arsphenamine used. In the first group of patients treated in plan 1, there were only 52.5 per cent negative dark fields after the first day of treatment. With each successive increase in the amount of arsphenamine given the first day there was a greater number of dark field negative cases after twenty-four hours. It was not until we reached the fifth plan, in which each patient received 1.0 Gm. of arsphenamine the first day, that 100 per cent of the dark fields became negative within twenty-four hours from the beginning of treatment, as shown by table 2.

Healing of all surface lesions was prompt and usually complete by the time the patient was discharged from the ward in seven days, irrespective of the plan used. Within twenty-four hours after beginning treatment the open lesions were noticeably drier, swelling was less and epithelization of the chancre was usually complete by the time of discharge. All secondary lesions healed promptly, the macular lesions disappearing within the first one or two days. All lichenoid and papular lesions became flat and healed completely, or practically so, within a week. The enlarged glands were the last to disappear, sometimes requiring two or three months or longer to subside.

Of the 332 cases treated by all plans, we shall discuss only the 178 that have been followed from six months to three years. One hundred and eighteen (66 per cent) are clinically and serologically negative and have normal spinal fluids. Three cases are still serologically positive at nine, ten and eleven months respectively. Their final outcome is pending (table 3).

Fifty-seven patients had an unsatisfactory outcome. Of this number 36 had cutaneous recurrences with recovery of spirochetes on dark field examination. Two of these cases that were dark field positive showed negative blood Wassermann reactions at the time of the recurrence. Also of these 36 cutaneous relapses 24 had become serologically negative for varying periods of time before their recurrence.

Of the 57 patients with unsatisfactory outcome 12 failed to become serologically negative by the end of a year, and 9 patients became negative but reverted to positive.

It will be seen then that of the entire 178 cases only 27 failed to become serologically negative at some time during the observation.

All cases that have not become serologically negative after one year's observation are classed as treatment failures.

Each patient had a spinal fluid examination before the treatment was begun. Of the entire group only 19 were found to have positive spinal Wassermanns in varying degrees. Four of these have become negative, 8 have been lost from observation, 4 had positive spinals at the end of one year and were successfully treated, and the remaining 3 are under observation.

Of the 57 unsuccessfully treated patients, 18 were retreated in the ward with a more intensified plan than was used originally. On the whole they tolerated the treatment better the second time, with the increased amount of drug, than they did originally. Further, it is interesting to note that all these patients except 1 had a Herxheimer reaction on the first or second day of the second course of treatment, with a rise in temperature to 100 F. or over, just as they had had in the first course. Eight of these patients had temperatures that rose to 102 F. or over. One patient had a nitritoid reaction with the first injection of the second course.

None of the relapsed cases that were retreated successfully in the ward have been added to the list of cures. The remaining relapsed cases were treated as ambulatory patients in the clinic. Two cases have had a second relapse.

Of all patients treated 69 are in the armed forces and 38 are in the Merchant Marine. Thirty-nine other patients are from out of the city and are classed as transients. One is in a sanatorium. Five are in defense jobs and are unable to report to the clinic. Three are dead: 1 in the ward, previously referred to, 1 killed in an automobile accident and the third dead from an unknown cause. We have lost 70 patients (20 per cent) from our clinic, and neither the social service department nor the board of health has been able to find them.

Twenty-one white and 4 Negroes, totaling 25 patients, ranging in age from 40 to 64, had an almost perfect follow-up. Forty-eight patients of the entire group treated were under 20 years of age, 42 Negro and 6 white. The latter group has been very difficult to follow.

LABORATORY ARSENIC STUDIES

A daily blood arsenic determination was made on each patient.⁸ The specimen was taken each morning before the first treatment. This represented a time interval of fourteen to fifteen hours between injections.

The blood arsenic levels revealed interesting facts which we believe are worthy of special mention. Most of the patients had a blood arsenic content that was normal or only slightly increased on admission, and every patient following the first day of treatment had an increase in arsenic that reached a maximum on the third to the sixth day, depending on the amount of arsenic given in each plan. There was no uniformity in the amount of arsenic retained or in the date on which retention reached its height, even when all

patients received the same amount of arsphenamine. There was, however, a definite tendency for a greater retention of arsenic as the age incidence of the individual increased. Moreover, there was in most cases a decrease in the amount of arsenic in the urine of the older patients.

There was also a decided increase in the incidence of reactions in patients 34 to 56 years old, whereas the minimum number of patients showing reactions was under 34.

The young men of both the light weight and the middle weight groups disposed of their arsenic better than did the heavy weight group, as revealed by the arsenic blood level curve. Even though the total amount of arsphenamine was less per kilogram of body weight in the heavy weight group there was greater retention than in the light weight patients who received larger amounts of arsphenamine per kilogram of body weight. This bears out our clinical experience, namely, that dosage cannot be satisfactorily gaged according to body weight. For this reason experimental work for standardization of dosage and the like on selected laboratory animals of relatively uniform physique cannot be carried across to human beings who are so different in build, age, health and so on.

The quantity of arsenic retained was virtually the same on the sixth day of treatment in the patients

TABLE 4.—Severe Reactions

	1	2	3	4	5	6	7	Total Cases
Plan variation.....	1	2	3	4	5	6	7	
Cases treated.....	47	40	60	103	27	18	37	
Encephalitis.....	1	1	..	..	..	..	..	2
Hepatitis.....	..	..	1	..	..	..	2	3
Dermatitis.....	..	..	..	..	..	1	1	2
Persistent neuritis.....	..	..	1	1	..	1	..	3
Leukopenia.....	..	1	1	..	..	..	..	2
Death (hepatitis).....	..	..	..	..	..	..	1	1

treated with small ascending doses of arsphenamine as it was in the patients to whom large doses were given on the first day and diminished toward the sixth day. This was true when the same amount of arsenic was given in each procedure.

Three things stood out quite definitely in the study: (1) There was always a retention of arsenic long after cessation of treatment; (2) all reactors showed a greater retention of arsenic and for a longer period of time than nonreactors; (3) the more arsenic received, the greater was the retention.

Patients receiving 1.0 Gm. of arsphenamine every other day for a total of 3.0 Gm. in five days had a definite spiking increasing blood arsenic curve, of the same type in each case.

The complete report of our findings of arsenic in the 332 cases studied will be included in detail in another paper.

REACTIONS TO TREATMENT

There were 12 severe reactions, 1 ending fatally. These included 2 of encephalitis with recovery, 3 of hepatitis (1 ending in death), 1 in an alcoholic addict, 2 of exfoliative dermatitis (1 mild), 3 of persistent neuritis and 2 of blood dyscrasias (table 4).

The first case of encephalitis appeared early in the experiment in a 20 year old Negro under the first plan of treatment in which the patient was given his injections three times a day for five days, receiving a total of 2.1 Gm. of arsphenamine. He developed a secondary rise in temperature during treatment, and on the second day his temperature reached 102.4 F. His

8. Macchling, E. H., and Flinn, F. B.: Colorimetric Determination of Small Amounts of Arsenic in Biologic Material, *J. Lab. & Clin. Med.* 15: 779, 1930. Macchling, E. H.: Separation and Determination of Bismuth and Arsenic in Biologic Material, *ibid.* 15: 1058, 1933.

temperature remained elevated and two days after cessation of treatment he had a slight tremor of the fingers, which was most noticeable when he was feeding himself. On the third day aphasia was apparent and he was unable to speak distinctly. He was stuporous, had a blank expression, would not obey commands and could not swallow, so that he had to be fed by stomach tube. He had to be catheterized daily, and his bowels were involuntary. He was given fluid and dextrose by vein. A spinal puncture was not done. On the fourteenth day he began to improve and was discharged thirty-three days after his admission, apparently none the worse for his experience except for urinary urgency. His spinal fluid was negative before treatment and has remained so. His blood Wassermann reaction reverted to negative in two months and has remained so.

The second case of encephalitis appeared eight days after completion of treatment in a 26-year-old Puerto Rican. He had received a total of 2.4 Gm. of arsphenamine, given three times a day for six days. He was nauseated and vomited on the last two days of treatment and had a mild nosebleed. His treatment had to be interrupted on the sixth day because of a secondary rise in temperature. Instead of receiving 2.55 Gm. of arsphenamine, as outlined, he received only 2.4 Gm. The temperature reached 104 F. after the treatment was stopped and was followed by a toxic erythema of a pronounced type that had a dark red to an almost cyanotic color with purpura developing distal to where a tourniquet was applied on his arm.

On the fifteenth day of his hospitalization, one day after his temperature had fallen to near normal, he developed a tremor in his hands, more pronounced on feeding himself. Within a period of twelve hours he became aphasic, could not obey commands and could not speak clearly. A lumbar puncture was attempted by another department, during which he had a convulsion. Four cc. of grossly bloody fluid was obtained which was thought to be due to trauma. His treatment consisted of dextrose infusions twice daily and sedation as required. He was semicomatose for four days, when he began to improve. His recovery was complete and he was discharged thirty-three days after his admission, apparently well. His blood Wassermann reaction was negative six months after treatment.

We had no way of foretelling that either patient would have encephalitis until the first signs of tremor appeared, followed later by aphasia.

Of the 3 cases of hepatitis, the first occurred sixty-three days after discharge from the hospital:

He was a chronic alcoholic addict aged 21. His hepatitis followed one of his periodic alcoholic bouts. This patient was in treatment plan 3. He received 2.0 Gm. of arsphenamine and tolerated his treatment well. His liver function tests had been normal on his first admission to the hospital and on subsequent clinic visits. He recovered from his hepatitis after a stay of fifteen days in the hospital. His blood Wassermann reaction became negative and remained so for about one and one-half years before he was taken into the Army.

The second patient, aged 22, developed symptoms of hepatitis three days after receiving 3.2 Gm. of arsphenamine in five days. There was no history of previous icterus or disease of the liver. His temperature rose on the fifth day, and treatment was stopped immediately. His cephalin flocculation tests rose from negative to 4 plus, together with a rise in temperature to 104.4 F., and a toxic erythema. Clinical jaundice was evident three days after treatment had been stopped.

The patient was nauseated throughout his treatment period and vomited. He ate very little food during this time and was given 1,000 cc. of 5 per cent dextrose solution intravenously twice daily, starting with the second day of treatment. His liver became enlarged and tender. The patient complained of pains all over his body and generalized weakness. He had pain also across his chest. The night of the sixth day he had a severe epistaxis, estimated at about 400 cc. His blood pressure rose from 140 systolic to 186 systolic. On the seventh day of his hospitalization he suddenly developed short, fast respirations and tachycardia. The heart and lungs were normal on physical examination except for a high right diaphragm. His temperature fell to 99.4 F. He had to be placed in an

oxygen tent. He grew gradually weaker and died on the evening of the ninth day after admission. Permission for postmortem examination could not be obtained.

The third patient, aged 31, showed no clinical evidence of jaundice but the diagnosis was made on the basis of a rise in cephalin flocculation from negative to 3 plus. Also his cholesterol blood level fell to 78 mg. per hundred cubic centimeters. He had a secondary rise in temperature to 102.4 F. and a toxic erythema. His total treatment was 3.2 Gm. of arsphenamine in six days. He had an uneventful recovery after a stay of twenty-one days in the hospital.

A transient leukopenia was observed in 2 patients:

The first was a 25-year-old Negro who had received 1.7 Gm. of arsphenamine in six days. His initial leukocyte blood count fell from 5,000 to 2,480 per cubic millimeter and polymorphonuclear leukocytes fell from 74 per cent to 43 per cent. The patient was given three small blood transfusions over a period of ten days. He recovered completely. His only symptom was a daily temperature that fluctuated between 102 and 104 F. The temperature fell to 98.6 F. after the blood transfusions and the blood count became normal. He has remained clinically and serologically negative for over two years.

The second patient with leukopenia, a 28-year-old Negro who received 2.4 Gm. of arsphenamine in six days, showed symptoms of agranulocytosis on the seventeenth day after treatment had been stopped. His leukocyte count of 8,560 per cubic millimeter of blood on admission with 70 per cent polymorphonuclear leukocytes fell to 6,400 leukocytes, with an absence of granular forms. Frequent blood counts in this interval revealed a gradual reduction of leukocytes and granulocytes. His recovery was spontaneous, without treatment of any kind, and complete in two and a half weeks. He too has been serologically and clinically negative for more than a year.

Three patients with severe neuritis have been persistent for approximately nine months, one year and one and one-half years respectively. Their ages were 26, 31 and 34 years, and they received 3.4 Gm., 2.0 Gm. and 3.0 Gm. respectively. Each patient complained of "pins and needles" sensation in the feet. They also had dull pain in the calves and knees. There was no ataxia. Two patients have continued to work. The third patient has an active pulmonary tuberculosis and is now confined to a sanatorium with that disease. All 3 are still serologically and clinically negative.

Of 2 patients with exfoliative dermatitis, the first patient, aged 33, developed dermatitis ten days after he was discharged from the hospital. He received 3.6 Gm. of arsphenamine. Treatment was discontinued on the fifth day because of a rise in temperature followed by a toxic erythema. He was discharged on the fourteenth day, well except for a little itching of the forearms and flanks. After being out of the hospital ten days he developed a generalized exudative dermatitis accompanied by edema. He was readmitted and hospitalized for three weeks. He had general thinning of hair and exfoliating of all nails. This patient has remained clinically and serologically cured for approximately eight months of observation.

The second case of dermatitis developed fourteen days after discharge from the hospital. A man aged 33 was in the seventh treatment plan and tolerated his drug well except for a pain in the pit of his stomach on the last day. His total dose was 3.9 Gm. of arsphenamine. This patient had a dry, itching, lichenified eruption that was generalized, with a few areas of exudation. He remained ambulatory and the condition cleared in approximately three weeks without any other symptoms. There were numerous minor reactions, such as an initial rise in temperature the first day that appeared in a great majority of cases and returned to normal the

next day. Although the temperature may have risen to 104 F. in the first afternoon, the regular injection of arsphenamine was given and the temperature would be normal the next day. Patients with secondary syphilitic manifestations often had redness and swelling of the surface lesions and tenderness of the glands. These too disappeared the following morning.

Secondary rises in temperature and toxic erythemas occurred near the end of the course, and mild neuritis usually appeared about two weeks after cessation of treatment. The neuritis was evidenced by transitory numbness and tingling of the hands and feet that usually cleared in a few days to several weeks.

The aforementioned reactions were the ones most commonly encountered, the incidence of their frequency increasing as the amount of the drug was increased. The occurrence of rise in secondary temperature over 100 F. was 25 per cent in the first group treated and increased to 89 per cent in patients receiving the greatest amount of arsphenamine. Mild neuritis rose from 2 per cent to 35 per cent. Toxic erythemas increased from 8 per cent to 40 per cent. All toxic erythemas were preceded by a rise in temperature of 100 F. or over.

These reactions, as a rule, were of no serious import and often were so mild as not to have been noticed by the patient or were brought out only on close questioning.

Traces of albumin were noted in the urine in 18 per cent of the cases. Ten cases showed as much as 3 plus albumin in the urine (based on 1 plus to 4 plus reaction). All these subsequently cleared following completion of treatment. Albumin, which was found in the urine of 7 patients before treatment was begun, disappeared completely in 5 of the cases during the course of the treatment.

Jaundice, without evidence of hepatitis, as demonstrated by negative cephalin flocculation reactions, was observed in 3 patients following toxic erythemas. Their recoveries were complete.

Vomiting at some time during the course of the treatment occurred in 22 per cent of the cases. Diarrhea, when present, usually occurred on the first day and was present in 10 per cent of the cases.

Still milder reactions included anorexia, nausea, abdominal pain, transient pruritus, herpes simplex, epistaxis, watering of the eyes, buzzing of the ears, herpes zoster and herpes progenitalis. All were transient.

OBSERVATIONS

A study of approximately 2,500 titrated Wassermann reactions showed that the higher the titer the longer the time required for the Wassermann reaction to become negative; the weaker the titer, the shorter the time. Patients with the highest titer, i. e. positive reaction in a dilution of 1:160 of the whole serum, required an average of twenty-two weeks to become negative and to continue so. Cases with titers positive in a 1:80 dilution required an average of fifteen weeks to become negative; those with 1:40 dilution, fourteen weeks; 1:20 dilution, eleven weeks, while those with a 1:10 dilution required 9.7 weeks to become negative. Cases showing a 4 plus reaction with a negative titer required an average of 8.9 weeks, while those with a 1 plus to 3 plus Wassermann reaction required only 4.1 weeks to reverse. The patients with seronegative primaries in which the blood Wassermann reaction

became positive during the treatment required 4.4 weeks to become completely negative again.

Those patients having positive titers greater than the usual 4 plus in undiluted serum were not only more resistant to treatment but had more than twice the number of recurrences than were found in the cases in which the initial blood Wassermann reaction was 4 plus or less: 37.2 per cent in the former as compared to 14.2 per cent in the latter.

These findings indicate that the earlier the treatment is begun in the syphilitic, preferably before the Wassermann reaction becomes positive (seronegative primary), the greater the chances of cure. One would infer that a patient whose blood Wassermann reaction does not become negative within six months from the beginning of intensive arsenotherapy and remain so should in all probability be considered inadequately treated.

The foregoing observations suggest that a syphilitic patient who becomes serologically negative after the expiration of six months from the date of his last treatment does so by the retention of arsenic or by his own body resistance.

TABLE 5.—*Moderate Reactions*

Plan variation.....	1	2	3	4	5	6	7
Cases treated.....	47	40	60	103	27	18	37
Primary rise in temp....	72.5%	82.5%	90.0%	80.5%	96.3%	94.4%	94.5%
Secondary rise in temp....	25.5%	22.5%	33.3%	34.4%	44.5%	59.0%	89.3%
Toxic erythema Mifflin..	8.5	12.5	16.6	22.3	14.8	55.5	35.7
Transient neuritis.....	2.1	7.5	11.4	12.6	14.8	33.3	28.5

TABLE 6.—*Weeks for Blood Wassermann Reaction to Become Negative*

Positive on Admission	Weeks to Become Negative
1/160 dilution titer.....	22
1/80 dilution titer.....	15
1/40 dilution titer.....	14
1/20 dilution titer.....	11
1/10 dilution titer.....	9.7
Four plus in undiluted serum.....	8.9
One plus to 3 plus in	4.1
Negative that became	4.4

Fifty-nine patients who were over 33 years of age became and have remained serologically and clinically cured to date with the exception of 3, and the latter patients had only serologic relapses. The fact that this same age group showed the greatest retention of arsenic would tend to substantiate our belief that the patients who became spontaneously cured long after cessation of treatment did so by the arsenic stored in their systems.

The percentage of cures was the same in patients who received a total of 3.0 Gm. of arsphenamine given in 1.0 Gm. doses on alternate days as in the patients receiving the same total amount of arsphenamine given daily.

The patients who received the largest dosage of arsphenamine (70 mg. per kilogram of body weight) had no reactions either while under treatment or subsequently and to date have remained serologically and clinically negative.

All patients receiving 1.0 Gm. of arsphenamine the first day were dark field negative within twenty-four hours after their first injection.

Sixty-one patients had seronegative primary lesions, 47 of whom reverted to positive while under treatment.

A large dose of arsphenamine on the first day of treatment in early syphilis was more effective than a small dose in rendering the lesions dark field negative, and the serious toxic reactions were no greater.

The greater the amount of arsphenamine given, the more frequent was the occurrence of primary fever and secondary fever, and the more severe the toxic erythema, nausea, vomiting, neuritis and dermatitis.

Patients reacting with fever or toxic erythemas showed no higher percentage of cures than those without such reactions.

All 12 patients who had severe reactions, hepatitis, encephalitis, dermatitis, blood dyscrasias and neuritis became serologically negative and have remained so.

Twenty-eight per cent of patients who had neuritis had symptoms within one week after finishing the treatment.

Both cases of encephalitis occurred with relatively small doses of arsphenamine, 2.1 and 2.4 Gm. respectively, given in fractional doses three times a day in the five and six day plans. Neither patient had spinal drainage, and both recovered.

Patients in the light weight groups who received the smallest amount of arsphenamine had the fewest number of cures.

Of the 36 mucocutaneous recurrences, 10 showed chancres with enlargement of the regional glands and recovery of spirochetes from the chancre. Some initial lesions were located at different sites from the original chancre. There was no way to distinguish the lesions in the recurring mucocutaneous relapses from those observed in the original infection.

No case of thrombocytopenic purpura was found clinically, nor was there a depression in the platelet counts that were done repeatedly on all patients.

Patients receiving over 55 mg. of arsphenamine per kilogram of body weight had the most satisfactory outcome.

Of the entire series treated, only 27 patients failed to become serologically negative.

SUMMARY

Three hundred and thirty-two patients with early syphilis were treated three or four times daily over five or six day periods with arsphenamine by the syringe method.

Of 178 patients followed for six months to approximately three years, 118 have remained clinically cured with negative blood Wassermann and spinal fluids.

Fifty-seven patients had unsatisfactory outcomes. Thirty-six of these had mucocutaneous relapses with recovery of spirochetes.

There was one death from toxic hepatitis. Two patients had encephalitis, 3 hepatitis, including the one mentioned, 3 severe neuritis, 2 exfoliating dermatitis and 2 blood dyscrasias.

CONCLUSIONS

As a result of our experience in this study we are forced to the opinion that treatment of early syphilis with arsphenamine by the multiple syringe method over a period of five or six days is ineffective, dangerous, expensive and altogether unpractical.

We are convinced that any such five or six day intensive treatment plan with arsphenamine, using the multiple syringe method, must be followed by additional therapy of a heavy metal, fever or both to be successful.

301 Park Avenue.

COMBINED FEVER AND ARSENO-THERAPY

IN THE INTENSIVE TREATMENT OF EARLY SYPHILIS

EVAN W. THOMAS, M.D.

AND

GERTRUDE WEXLER, M.D.

NEW YORK

Since Ehrlich's discovery of arsphenamine, the treatment of syphilis by the intensive use of arsenical drugs has been associated with the hazard of toxic reactions. The introduction of arsenoxide, which permitted smaller doses of arsenic with equally good therapeutic results, lowered the incidence of toxic effects but failed to eliminate them.

Eagle and Hogan¹ in their reports on the toxicity of arsenoxide, calculated from experiments in animals, showed that the margin of safety in man was only about 3.0 when a total dose of 1,200 mg. of mapharsen was given to the average adult in five to ten days. They considered this margin of safety dangerously low. When mapharsen alone is used in the rapid treatment of syphilis, clinical experience indicates that a total of 20 to 30 mg. per kilogram of body weight is needed for the best results. From our experience at Bellevue Hospital, Eagle and Hogan were correct in considering a schedule of therapy requiring this amount of mapharsen in a five to ten day period too dangerous for routine use.

A false sense of security can easily be acquired in intensive arsenotherapy, because one may give a hundred treatment courses with relatively large amounts of mapharsen and encounter no serious difficulty only to be rudely awakened by a grave reaction in the very next treatment. So far no one has collected into a single statistical table all of the available data on the toxic effects of intensive arsenotherapy. When this is done for treatment schedules where mapharsen alone was given in five to ten days, it will probably be found that the incidence of encephalopathy has been over 1 per cent. This at least was our experience at Bellevue Hospital.

Following our first death from arsenical encephalopathy, we tried lowering the total dose of mapharsen and turned to fever to reinforce the action of these lowered doses. Originally we believed that the combination of fever with chemotherapy not only would permit smaller amounts of mapharsen but might also protect against its toxicity, as Rose, Simpson and Kendell² suggested. Consequently we completed several relatively large series of treatment courses using various combinations of mapharsen with fever induced by typhoid vaccine. Every one of these schedules called for two injections of about 60 mg. of mapharsen

Aided by grants from the United States Public Health Service. From the Department of Dermatology, New York University College of Medicine, and the Department of Dermatology and Syphilology, Third Medical Division (New York City), Bellevue Hospital.

Read in a panel discussion on "Intensive Therapy of Early Syphilis, with Special Reference to Arsenotherapy Either Alone or Combined with Other Agents," before the Section on Dermatology and Syphilology, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Eagle, H., and Hogan, R. B.: An Experimental Evaluation of Intensive Methods for the Treatment of Early Syphilis, *Ven. Dis. Inform.* 24: 33, 69 and 159, 1943.

2. Rose, D. L.; Simpson, W. M., and Kendell, H. W.: Quantitative Serologic Studies in Early Syphilis: III. Treatment with a Single Intensive Session of Combined Fever-Chemotherapy, *Ven. Dis. Inform.* 23: 411, 1942.

on at least one day of treatment. The incidence of arsenical encephalopathy, however, continued to be over 1 per cent, although most of the reactions were less severe because of the lower total dose of mapharsen. Thus it was evident that fever failed to protect against the toxicity of arsenic. And, in fact, Carpenter and his co-workers³ recently have reported that in animals fever actually increases the toxicity of mapharsen; but it also enhances the effectiveness of arsenotherapy and so permits smaller amounts of drug.

Table 1 shows that among 321 treatment courses given at Bellevue Hospital with mapharsen alone in a six to ten day period the incidence of encephalopathy was 1.6 per cent. In a series of 588 treatment courses with combined fever and mapharsen in which two injections of about 60 mg. of mapharsen were given on at least one day of treatment, the incidence of encephalopathy was 1.36 per cent. In the total series of 909 treatment courses encephalopathy occurred in 1.43 per cent and the mortality rate was 1 in 300.

The advantages of rapid treatment for early syphilis to both the community and the patient are so great that one might justify even a mortality of 0.3 per cent if safer means of rapid cure were unavailable. But obviously our task was to find safer schedules of treatment. As we have as yet no means of determining in advance the tolerance of individuals for arsenical drugs, we attempted to find the dose of mapharsen which could be given in five to ten days without danger to those particularly susceptible to arsenic. To determine this as well as the effectiveness of the therapy, it was necessary to give relatively large series of treatment courses. A death attributed to treatment made us change the schedule of therapy, but it was not until after our third fatality that we finally found a method of treatment which proved acceptable.

In formulating our schedules of therapy we had to consider not only the total amount of mapharsen which could safely be given in five to ten days but also the maximum single dose which could prudently be given at daily intervals. By July 1942 we determined that the maximum single dose of mapharsen per day was approximately 1 mg. per kilogram of body weight and the minimum period of treatment was ten days. With this schedule the average patient received ten daily injections of about 60 mg. of mapharsen. To reinforce treatment with this low dosage, four fevers induced by typhoid vaccine were included in the ten days.

The fevers as a rule were given on the second, fourth, sixth and eighth days. The vaccine used was obtained from the New York City Department of Health and contained 1,000 million *B. typhosus*, 750 million *B. paratyphosus A* and 750 million *B. paratyphosus B*. per cubic centimeter. The first fever was induced with an initial injection of 0.1 cc. of this vaccine intravenously, the second with 0.2 cc., the third with 0.4 cc. and the last with 0.6 cc. From one and one-half to two hours after the initial injection another dose was given of equal amount in most cases. The response to these injections varied, but in general these doses caused a fever of at least 104 F. for about four hours.

The induction of fever with typhoid vaccine causes discomfort to patients, but this can usually be alleviated with sedatives, such as isonipocaine or, if necessary,

morphine. In our opinion the induction of fever with typhoid vaccine is safer than with electropyrrexia. The latter is more effective therapeutically, because more sustained and higher fevers can be produced, but it is less practical because the necessary equipment and personnel for inducing fevers with electropyrrexia are not usually available. At Bellevue Hospital we have given typhoid vaccine intravenously in over 1,650 treatment courses without a single serious reaction due to the vaccine.

In June 1943, further to enhance the effect of treatment, we added bismuth to our schedule of rapid treatment, giving intramuscular injections of 0.1 Gm. of bismuth salicylate in oil on the first, third, seventh and tenth days of therapy. Thus, our standard chart of therapy came to be as shown in table 2.

By May 1, 1944 we had given 1,163 treatment courses according to this plan without a single fatality. Only 3 very mild cases of encephalopathy were encountered. The diagnosis in all 3 was made chiefly by finding increased cells and protein in the spinal fluid. One patient developed an agranulocytosis, with complete recovery after a single transfusion with whole blood.

TABLE 1.—Cerebral Reactions

	Mapharsen Only	Mapharsen and Typhoid 7-8 Day Treatment	Total
Number of treatment courses.....	321	588	909
Encephalopathy.....	5 (1.6%)	8 (1.36%)	13 (1.43%)
Deaths.....	1 (0.3%)	2 (0.34%)	3 (0.33%)

TABLE 2.—Ten Day Plan of Treatment

	1	2	3	4	5	6	7	8	9	10
Mapharsen, 1 mg. per kilogram...	x	x	x	x	x	x	x	x	x	x
Typhoid vaccine, 0.1 cc.	x		x		x		x		x	
Typhoid vaccine, 0.2 cc.		x		x		x		x		x
Typhoid vaccine, 0.4 cc.					x					
Typhoid vaccine, 0.6 cc.						x				
...		0.1		0.2		0.4		0.6		

Unfortunately, this record was broken even as this paper was being written. On May 5, 1944 a white woman with secondary syphilis, who was six months pregnant, developed encephalopathy following her fifth injection of 70 mg. of mapharsen and died. During the five days of treatment she had had only one fever induced by typhoid vaccine. This tragic accident again shows that, when arsenical drugs are used, there is always the danger of a fatal accident in a person who has a definite sensitivity to arsenic. Fatal arsenical encephalopathy has occurred after only two injections of neoarsphenamine given five days apart; and as long as syphilis is treated with arsenic the rule of constant alertness by those administering the treatment can never be broken. Arsenical encephalopathy strikes like a bolt from the blue, but in many cases fatal reactions can be prevented by the caution which comes from experience. We have found that the apprehensive, worrying type of individual demands special attention. It is also probable that pregnancy adds to the risk of intensive arsenotherapy. Our recent fatality occurred in a woman who was both apprehensive and pregnant. In addition, her treatment was started at a time of confusion, when the syphilis service at Bellevue Hospital was being moved to new quarters.

By May 15, 1944 we had completed 1,181 treatment courses with the schedule of therapy we had adopted in July 1942. On this schedule the incidence of serious

3. Jones, N.; Carpenter, C. M.; Boak, R. A.; Warren, S. L., and Hanon, H.: The One Day Treatment of Syphilis with Fever and Mapharsen. Ven. Dis. Inform. 25:99, 1944.

reactions is very low. As shown in table 3, the incidence of encephalopathy among our patients dropped from 1.43 per cent to 0.34 and the mortality rate is 1 in 1,181 instead of 1 in 300. Since our latest and, we hope, our last fatality we have slightly modified the schedule of treatment so that the mapharsen is injected in the late afternoon instead of the morning. This means that on the fever days the injection of mapharsen follows the fever instead of preceding it.

RESULTS OF TREATMENT

In compiling statistical results of treatment we have chosen six months as the minimum follow-up period which is likely to give a fairly accurate estimate of the effectiveness of the treatment. This period has been chosen both because the serologic tests of most patients with early syphilis become negative within six months after effective rapid therapy and because the majority of relapses occur within this period. A careful analysis of all the relapses or reinfections which have come to our attention at Bellevue Hospital following rapid

TABLE 3.—Cerebral Reactions in Ten Day Treatment

Number of treatment courses.....	1,181
Encephalopathy.....	4 (0.34%)
Deaths.....	1 (0.08%)

TABLE 4.—Results of Ten Day Treatment

	Total	
	Number	Per Cent
Status of patients followed:		
Lost (followed less than 6 months).....	337	43.7
Number followed 6 to 36 months.....	435	56.3
Total number treated.....	772	100.0
Probable favorable results:		
Negative serologic reactions.....	304	69.9
Wassermann titers less than 8.....	47	10.8
Probable favorable results (total number)...	351	80.7
Unfavorable results:		
Relapse or reinfection.....	59	13.6
Wassermann titers greater than 8.....	25	5.7
Unfavorable results (total number).....	84	19.3
Total number followed.....	435	100

treatment for early syphilis makes us hesitate to distinguish between relapses and reinfections in compiling statistical tables. We believe that reinfections are much more frequent than relapses after six months. Consequently an observation period of six months enables us to differentiate somewhat between a fairly valuable follow-up and one that is less revealing of the probable results of treatment.

We excluded from the analysis of therapeutic results all patients lost within the first six months of follow-up, regardless of whether or not they had negative serologic tests when last seen. Patients with Wassermann titers less than 8, as reported by the New York State Department of Health serologic laboratory, are included among those with a satisfactory status because experience has proved that almost all such patients go on to become seronegative. Patients with Wassermann titers greater than 8 six months or more after treatment are reported as unsatisfactory results, although some of them may become seronegative without further treatment. This method of reporting is based on over four years of experience in observing quantitative serologic tests for syphilis. From our experience, as long as Wassermann titers of the blood are falling or remain at low levels, further treatment is not indicated.

As our case load at Bellevue Hospital has increased decidedly since August 1943, many patients treated according to the schedule of therapy we have just described have been followed for too short a period to be included in the present tabulation of results. It should also be stated that most of the patients on whom treatment results are reported did not receive bismuth in addition to mapharsen and fever. The percentage of patients kept under observation is not as high in this group as in previous groups, partly because of the increased case load but chiefly because of the increased number of sailors and transients admitted to the hospital for the rapid treatment of early syphilis.

Included among the treatment results summarized in table 4 is a relatively small group of patients who received a total of 0.54 Gm. of mapharsen and four fevers induced by typhoid vaccine prior to July 1942. This group is included because the treatment was similar and because the patients in it have been followed for longer periods.

The percentage of satisfactory results reported in table 4 is not quite as high as for most of the schedules of treatment published in our previous reports,⁴ but the differences are not very significant and the percentage of 80.7 satisfactory results is almost identical with that given in a recent report by Schoch and Alexander,⁵ who used much larger doses of mapharsen without the addition of fever.

138 East 36th Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. EAGLE, DRS. CANNON, FISHER,
RODRIGUEZ, BEATTIE AND MAECHLING AND
DRS. THOMAS AND WEXLER

DR. HERBERT RATTNER, Chicago: It is eleven years since Dr. Chargin and his associates introduced the five day treatment with neoarsphenamine. Since then many modifications of the original method have been introduced: the one day arsenofever method, which received so much premature publicity but of which little is heard today; the use of arsenic and bismuth administered concurrently in a course of five days; the syringe method, in which the drug is administered in seven, ten or twenty days, and the three methods reported today. Dr. Cannon concluded that his method had little merit. The methods of Eagle and Thomas are equally effective with respect to their "curative" values. With both methods there was an incidence of about 1:1,200 of fatal reactions. Thomas's fatality occurred in a pregnant woman, and he suggests therefore that pregnancy adds to the risk of intensive arsenotherapy. At our hospital we treated 29 pregnant women in all stages of pregnancy by the five day method without a serious reaction, and in each case there was a normal baby. With the method of Thomas the patient is isolated, rendered noninfectious quickly, wilful lapse from treatment is reduced to a minimum, and untoward reactions can be treated early. With Eagle's routine the patient continues at work, but inevitably when one relies on a patient to return of his own will there results a high lapse rate. Apparently any rapid method will cure the majority of patients who receive a sufficient amount of drug. Statistics indicate that the shorter the course of treatment, the greater the element of risk, but there are times when one must assume the risk. At the Cook County Hospital we used the five day method on 480 patients without a fatality. We attribute these good results in part to our willingness to discontinue treatment temporarily for the smallest reason—persistent headache, nausea or fever, and in such cases concentrated glucose was administered liberally.

4. Thomas, E. W., and Wexler, G.: Rapid Treatment of Early Syphilis with Multiple Injections of Mapharsen, *Am. J. Pub. Health* 31: 545, 1941; Rapid Treatment of Early Syphilis, *Arch. Dermat. & Syph.* 47: 553 (April) 1943.
5. Schoch, A. G., and Alexander, L. J.: Infections and Serologic Relapse During Intensive Arsenotherapy of Early Syphilis, *Am. J. Syph., Gonorr. & Ven. Dis.* 28: 221, 1944.

There are available to the physician a number of methods from which to choose that which is best suited to the patient's needs. Dr. Thomas's method is excellent for public practice. For the private patient who can be trusted to return for treatment, the Eagle method may be safer. For the traveling man who has but a week to give to treatment the five day treatment is eminently suitable. And if he wishes that there be no hospital record, one could use the Schoch syringe technic.

DR. E. A. STRAKOSCH, Chicago: From Oct. 31, 1942 through April 30, 1944 we started 515 patients on the Eagle-Hogan regimen at the Chicago Intensive Treatment Center. These were patients with primary, secondary or early latent syphilis who, on account of heart, chest or other pathologic findings, were ruled out from intensive fever-chemotherapy or the modification of the Schoch-Alexander treatment; 470 patients were started on the eight weeks and only 45 on the ten weeks schedule. It is noteworthy that only 211 patients completed their treatment. Of the 211, only 58 completed it on time; 132 patients became delinquent; 57 patients moved out of our jurisdiction—Army, Navy or somewhere else—and 103 patients stayed under our treatment. The range of delinquency goes up to 204 days. The treatment had to be discontinued in 12 patients because of nephrosis in 1 case, hepatitis after the fifth arsenic injection in another and severe bismuth stomatitis in 9 cases, and because of an uncooperative attitude in another. Seven patients were retreated: 1 with primary syphilis on account of serologic progression, 4 patients with secondary syphilis, 2 on account of cutaneous relapses, 2 on account of serologic relapse and 2 patients with latent syphilis whose Kahn titer was still positive or unchanged six months after the treatment was finished. These 7 patients took their treatment irregularly and did not finish it in time. It is my opinion that the Eagle-Hogan treatment method is a more practical, safer and to some extent better method than the other methods used by us, such as the fever-chemotherapy or the Schoch-Alexander method or its modifications. The definite disadvantage is the high treatment delinquency even in a treatment schedule as short as eight weeks.

DR. ARTHUR CURTIS, Ann Arbor, Mich.: By far the most serious complication of massive arsenotherapy is hemorrhagic encephalitis. Last fall Dr. Mallory and I, hoping to find some procedure which might enable us to anticipate the development of hemorrhagic encephalitis, set up the following experiment for patients receiving intensive arsenotherapy: On the day before treatment was begun, the first day of treatment, the third day of treatment and the fifth day of treatment, as well as two days after treatment ceased, the following procedures were done: a complete blood count, bleeding time, clotting time, prothrombin time, vitamin C level, positive pressure tourniquet test (Rumpel-Leede) and a negative pressure test. With these procedures we followed 58 consecutive patients on massive arsenotherapy. During this period there were 7 cases of hemorrhagic encephalitis with 2 fatalities. All patients that developed hemorrhagic encephalitis, with the exception of 1 male, had a positive pressure tourniquet test (Rumpel-Leede) before the onset of clinical symptoms. Since that time we have used the positive pressure tourniquet test (Rumpel-Leede) on all of our patients receiving intensive arsenotherapy. Treatment is stopped immediately on the appearance of any petechial hemorrhage by this test. We have not had a case of hemorrhagic encephalitis since that time.

DR. GEORGE N. SCHWEMLEIN, Chicago: The Section on Fever-Chemotherapy at the Chicago Intensive Treatment Center is continuing the study of the use of artificial fever combined with chemotherapy in early syphilis. Past experiences have demonstrated that this type of therapy has been beneficial in neurosyphilis and congenital and ocular syphilis; it was a natural step to investigate the effect of this procedure on the early stages of syphilis. We have employed a single eight hour session of artificial fever at 105 to 106 F. rectal level, with varying amounts of mapharsen and bismuth. On the basis of 1,500 patients treated the following observations may be noted: Combined artificial fever-chemotherapy is effective in completely arresting the disease; the method is advantageous in that relatively small amounts of mapharsen and bismuth are employed; the use of physically induced fever is as satisfactory as other methods; from the public health standpoint infectious syphilis can be quickly controlled in the vast majority of cases.

DR. J. R. DRIVER, Cleveland: It has been shown here today that a large proportion of patients treated for early infectious syphilis by short, intensive methods can be rendered noninfectious and probably cured. However, these methods are still experimental, are attended by more risks than the standard treatment procedures and should be used only by experts. Justification for their use lies chiefly in the control of large groups of early syphilitic infections that present a public health hazard especially in our large urban centers. The great majority of syphilitic infections occur among the most ignorant and least cooperative of our population. The difficulty in the past has been to keep them under treatment long enough to render them noninfectious. Therefore the desirability of intensive treatment procedures is obvious. With the Eagle method the patients are treated in the outpatient clinics, and the lapse rate due to uncooperative behavior is higher. In our treatment centers at the university hospitals and at the Cleveland City Hospital, out of 178 cases in which treatment was begun, completion of treatment was obtained in only 92. A few of these were given other forms of treatment because of vacations, but the great majority were lost as a result of uncooperative behavior. The advantage of the Thomas method lies in the fact that the patients are hospitalized during the entire course of treatment. Out of 252 cases in which we have begun treatment by this method, the course has been completed in 243. In 9 cases other forms of therapy were instituted because of severe reactions. In only 1 instance was treatment discontinued because of uncooperative behavior.

DR. ROY L. KILE, Cleveland: Dr. Driver has explained the series of cases we have observed in Cleveland on the Thomas-Wexler routine. There was one death, which Dr. George Binkley observed, wherein a batch of mapharsen was used that was outdated. This was the only serious reaction in 266 cases treated by this routine. I want to call attention to the fact that there may be some variation in different batches of mapharsen, more reactions having been noted with certain ones. The results with the Thomas-Wexler routine have been very satisfactory. The patients are hospitalized during their treatment and are free to return to work in a comparatively short time.

DR. ARTHUR G. SCHOCH, Dallas, Texas: The addition of bismuth to any arsenical regimen for the treatment of early syphilis seems to be a necessity. We thought that the addition of a rapidly acting oil soluble bismuth, bismuth ethyl camphorate, should be one step beyond the use of the slowly acting insoluble bismuth salicylate in oil. So far our results have been very encouraging. Using the Eagle triweekly schedule and substituting bismuth ethyl camphorate for bismuth salicylate, appraising results on patients who have been followed for at least eight months or longer, our failure group is 5.3 per cent. Our successes in that particular group, which totals 131, are 94.7 per cent.

DR. HARRY EAGLE, SURGEON, U. S. P. H. S.: The point has been raised as to the differentiation between reinfection and relapse in treated cases of early syphilis. The distinction is so difficult and the final decision is often so arbitrary that in the evaluation of a new therapeutic procedure any treated case in which dark field positive lesions develop within one to two years must be adjudged a treatment failure unless the evidence for reinfection is overwhelming. Those who are studying the intensive treatment of early syphilis are not necessarily protagonists of a particular procedure to the exclusion of all others. There are indications for highly intensive arsenotherapy and indications for more conservative treatment, and the correct procedure to be followed in the individual case must be decided by the physician on its own merits. There is no universally applicable method of choice. The best record will be given by a highly intensive procedure applied to a hospitalized patient. On the triweekly schedule I have described a certain proportion of patients will necessarily be lost, but the case holding record will be better than with routine weekly treatment continued for a year and a half. It is impossible to estimate precisely what the case holding record has been in our own study, because the duration of the scheduled treatment has deliberately been varied. Moreover, the proportion of patients completing their scheduled treatment has varied from as high as 90 per cent in some clinics to as low as 20 per cent in others. The degree to which patients

lapse is affected by many variables, a few of which are the type of patient, the efficiency of the social service workers and the quality of the medical care in the clinic itself. On a triweekly schedule more patients will receive an adequate amount of treatment than is the case with a weekly schedule but less than with a schedule involving hospitalization. In analyzing our results, no attempt was made to distinguish between the efficacy of the various types of bismuth preparation. Eighty per cent of the patients received bismuth subsalicylate and more than 90 per cent of those received 0.2 Gm. per weekly injection. Our experimental data indicate that, except for a possible slight superiority of an oil soluble preparation, there is but little difference in the therapeutic efficacy of the several types of bismuth preparations in current use.

DR. JEROME K. FISHER, New York: I realize that a paper as pessimistic as ours doesn't leave much room for comment. With the advent of penicillin and the extensive use of phenarsine compounds in intensive treatment of early syphilis, you have likely heard the swan song of arsphenamine. Our report has been based on all the cases, and those include the cases in which we gave only 1.5 Gm. The treatment of the cases in the sixth variation of our plan, all of which we have followed for six months or longer, has been 100 per cent effective. Our study showed that not all patients require the same amount of arsphenamine. In our early studies we had secondary cases that cleared completely and have been negative for over two years with 1.5 Gm. of arsphenamine. In our later group we had 2 seronegative primary cases in which 3.2 and 3.4 Gm. of arsphenamine were administered in six days which later became seropositive, with lesions and spirochetes recovered. Another fact brought out in our paper is that the largest doses of arsphenamine can be given in the first few days of treatment when the patient is in the best condition. That was the reason for the reversing of our schedule, so that in the allotted time, should a patient be ill, he would have the greatest quantity in his system. We retreated 18 patients. None of these have been included in the present report as having a second course of treatment or have been entered into any of the calculations. Of those 18 cases, all but 1 presented a Herxheimer reaction on the first day of the second course of treatment. In 8 of them the temperature ranged from 102 to 104 F. The paper, although unfavorable so far as the outcome of the use of arsphenamine is concerned, offers a great deal of other information, which unfortunately Dr. Cannon did not have time to include. I think that this will be of value in estimating other plans of intensive treatment, perhaps with penicillin.

DR. EVAN W. THOMAS, New York: With reference to reinfection and relapses, I agree heartily with Dr. Eagle that we must be very conservative. Of the relapses listed in the table which I showed, 12 were seronegative at the time they reappeared with dark field positive lesions. Those, I presume, might be listed as reinfections. However, we have other patients who were followed for thirty months or more. These patients came in with dark field positive lesions after they had been negative for over twenty-six months. They gave histories of promiscuous exposures. They were undoubtedly reinfections, but they were not seronegative at the time they came back. When I discussed the relapses and reinfections in my series, there was not agreement in every case. If you permit any particular person to decide which is a relapse and which is a reinfection, you may get into trouble. I was interested in what Dr. Bruyere said about the age groups. I wonder if it isn't possible that the much higher incidence of relapses in the younger age group is due to the fact that in the younger age group there were many more reinfections than there were in the old age group. It seems to me that is the most plausible explanation. It is exceedingly difficult to get a high follow-up percentage when you deal with Harlem patients in New York City. Nothing caused us such trouble or gave so much work as that follow-up. We still have under observation about 55 per cent of the patients treated in 1940, which I think is extraordinary for New York City. Of this last group only something like 53 per cent were followed over six months. We are now treating many Dutch, Scandinavian and English sailors. It is impossible, no matter what the follow-up system may be, to follow those patients.

MASSIVE ARSENOTHERAPY FOR SYPHILIS

UNITED STATES PUBLIC HEALTH SERVICE
EVALUATION

COOPERATING CLINICS OF NEW YORK AND MIDWESTERN GROUPS

Since the first experiments with massive arsenotherapy for syphilis using neoarsphenamine by slow intravenous drip, many methods of intensive treatment have been developed. The present study is concerned with a group of 4,351 intensive treatments for early syphilis contributed to the U. S. Public Health Service Field Study of Massive Arsenotherapy by the twenty-two cooperating clinics listed in table 1. This group of patients is limited to cases in the first four years of infection with or without active manifestations, treated dur-

TABLE 1.—Hospitals Cooperating in the U. S. P. H. S. Field Study of Massive Arsenotherapy for Syphilis, and the Number of Cases of Early Syphilis Contributed to the Study by Each

Name and Location of Hospital	Cases of Early Syphilis Treated
Bellevue Hospital, New York City.....	1,034
Long Island College Hospital, Brooklyn.....	57
Mount Sinai Hospital, New York City.....	402
New Haven Hospital, New Haven, Conn.....	13
Presbyterian Hospital, New York City.....	258
Riker's Island Prison Hospital, New York City.....	25
Sing Sing Prison Hospital, Ossining, N. Y.....	36
Broadlawn Hospital, Des Moines, Iowa.....	91
Cleveland City Hospital, Cleveland.....	10
Coles County Free Treatment Center, Mattoon, Ill.....	5
Cook County Hospital, Chicago.....	463
East Side Health District, East St. Louis, Ill.....	2
Henry Ford Hospital, Detroit.....	20
Herman Kleber Hospital, Detroit.....	417
Indianapolis City Hospital, Indianapolis.....	560
Isolation Hospital, St. Louis.....	421
Louisville General Hospital, Louisville, Ky.....	124
University of Minnesota Hospital, Minneapolis.....	36
St. Elizabeth's Hospital, Belleville, Ill.....	26
St. Joseph's Hospital, Bloomington, Ill.....	2
State General Hospital, Madison, Wis.....	12
University Hospital, Ann Arbor, Mich.....	297
Total, all hospitals.....	4,351

ing the period 1933-1943 inclusive. However, the analysis of results deals only with cases in which there was active evidence of primary or secondary syphilis. Six different schemes of treatment were employed, as shown in table 2.

The follow-up observation on the cases studied was far from complete, but it was adequate for purposes of analysis. As shown in table 3, 18 per cent of the cases were not seen after discharge from the hospital, two thirds were not seen more than one year after treatment, and 85 per cent were not followed beyond the second year.¹ From the point of view of analysis of treatment results as affected by the adequacy of follow-up, it is of interest to note that only half of the secondary recurrences observed occurred in the first six months

Prepared under the direction of Miss Lida J. Usilton, Principal Statistician, with the assistance of Dr. Paul T. Bruyere and Mrs. Martha C. Bruyere, Statistical Section, Venereal Disease Division, U. S. Public Health Service.

Surgeon David C. Elliott, U. S. Public Health Service, was responsible for the promotion, organization, and carrying through of this cooperative endeavor, reporting in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, Oct. 4, 1941, page 1169, the early progress on results of massive arsenotherapy for syphilis for the Midwestern and New York groups.

1. A considerable part of the cases were treated in 1942 and 1943 and hence could not have been observed as long as two years.

after treatment, and that as many as 12 per cent occurred more than one year after treatment.

In evaluating the results obtained, four broad groups were defined as "final outcomes": 1. A case negative for at least three months when last seen was considered to have experienced a "satisfactory result." 2. A case still positive or fluctuating when last seen a year or more after treatment was considered to be "serologically fast." (A fluctuating case was defined to be 1 in which the serologic test on the blood had been negative at some time after treatment, but never for as long as three consecutive months, and had subsequently become posi-

methods, such examinations were reported for too small a proportion of the cases.

For each treatment method included in the study, a greater percentage of satisfactory results was obtained among primary cases than among secondary cases. The percentages are given in table 4. Likewise, among

TABLE 2.—*Methods of Treatment Evaluated in the U. S. P. H. S. Field Study of Massive Arsenotherapy for Syphilis, Number of Cases of Early Syphilis Treated by Each Method, and Number of Cases Followed After Treatment by Each Method*

Method of Treatment	Cases of Early Syphilis Treated	Cases Followed After Treatment
Slow intravenous drip, neoarsphenamine.....	110	100
Slow intravenous drip, mapharsen.....	2,451	1,871
Rapid intravenous drip, mapharsen.....	450	398
Multiple syringe injection, mapharsen.....	275	228
Multiple syringe injection, mapharsen plus typhoid vaccine.....	779	637
Multiple syringe injection, arsphenamine.....	261	241
Miscellaneous other methods.....	23	...
Total, all methods.....	4,351	3,575

TABLE 3.—*Length of Time Cases Were Followed After Treatment and the Time at Which Clinical Relapses Occurred*

Months After Treatment	Cases Treated, Per Cent Still Under Observation	Clinical Relapses	
		Per Cent Occurring in Period	Cumulative per Cent
1.....	82.4	1.3	1.3
2.....	76.7	3.3	4.6
3.....	70.2	10.2	14.8
4.....	64.6	13.0	27.8
5.....	59.9	11.4	39.2
6.....	55.2	12.3	51.5
7.....	50.2	11.8	63.3
8.....	46.1	8.9	72.2
9.....	42.5	5.0	77.2
10.....	39.1	5.1	82.3
11.....	35.9	2.9	85.2
12.....	33.3	3.0	88.2
13-15.....	30.7	3.4	91.6
16-18.....	24.4	3.8	95.4
19-21.....	19.5	0.8	96.2
22-24.....	15.5	2.1	98.3
25-30.....	12.1	0.9	99.2
31-36.....	7.4	0.4	99.6
37 and over.....	4.0	0.4	100.0

tive. The last observation might be either positive or negative.) 3. A case positive or fluctuating at last observation which had previously fulfilled the criteria for satisfactory result was considered to be a "serologic relapse." 4. A case experiencing relapsing secondary syphilis was considered to be a "clinical relapse." As far as possible, reinfections were excluded from this last category by means of the following criteria: completion of the prescribed course of treatment; blood negative to all serologic tests on two consecutive observations at least one month apart following completion of treatment; new lesion, not typical of recurrence, appearing prior to a serologic relapse. Spinal fluid test results could not be used in defining the final results as listed, because of the fact that, for several of the treatment

TABLE 4.—*Results Obtained with Massive Arsenotherapy in Early Syphilis, Showing the Estimated Percentage of Cases in Each Final Outcome Following Each Method of Treatment, by Diagnosis at Time of Treatment*

Method of Treatment	Satisfactory		Serologically Fast		Serologic Relapse		Clinical Relapse	
	Pri-	Sec-	Pri-	Sec-	Pri-	Sec-	Pri-	Sec-
	mary	dary	mary	dary	mary	dary	mary	dary
Slow drip, neoarsphenamine.....	89.5	85.7	5.3	2.4	...	2.4	5.3	9.5
Slow drip, mapharsen.....	85.7	71.8	4.5	10.6	3.2	3.4	6.6	14.2
Rapid drip, mapharsen.....	85.4	64.5	5.7	9.9	4.7	9.9	4.2	15.7
Multiple injection, mapharsen.....	85.4	72.3	2.4	9.2	...	4.0	12.2	14.5
Multiple injection, mapharsen plus typhoid vaccine.....	88.5	70.2	2.3	17.7	4.6	4.4	4.6	7.7
Multiple injection, arsphenamine.....	78.6	56.7	3.9	14.2	5.8	8.7	11.7	20.4
Total, all treatments.....	85.7	70.4	4.3	11.9	3.5	4.6	6.4	13.1

patients with secondary syphilis there developed more serologically fast cases, serologic relapses and clinical relapses proportionally than among primary cases. An average of 85.7 per cent satisfactory results was obtained in primary syphilis as opposed to 70.4 per cent in secondary syphilis. Six and four tenths per cent of the primary cases exhibited clinical relapse and 13.1 per cent of the secondary cases.

In comparing the several methods of treatment it was found that, although the differences in results from one treatment to another were not great, nevertheless not all of them can be ascribed to chance. In general, excluding the original slow drip with neoarsphenamine, which was found by its authors to be too reactive, the best results were obtained through the use of multiple injections of mapharsen combined with typhoid vaccine. Least effective, both in inducing satisfactory results and in preventing clinical relapses, were multiple injections of arsphenamine. However, when the material was

TABLE 5.—*Results Obtained with Massive Arsenotherapy in Early Syphilis, Showing the Estimated Percentage of Cases in Each Final Outcome Following Initial Treatment and Following Retreatment*

Stage at Time of Treatment	Final Outcome			
	Satisfactory	Serologically Fast	Serologic Relapse	Clinical Relapse
Primary syphilis.....	85.7	4.3	3.5	6.4
Secondary syphilis.....	70.4	11.9	4.6	13.1
Clinical relapse following routine treatment.....	59.2	29.5	6.8	4.5
Clinical relapse following massive arsenotherapy.....	68.9	17.2	4.0	9.9
All clinical relapses.....	67.2	20.0	4.6	8.2
Possible reinfections, any stage..	73.5	17.0	3.8	5.7

analyzed by amount of arsenical given (table 7) there were indications that the poor results obtained with this method may have been due to insufficient dosage.

The therapeutic results, then, that can be expected from present methods of massive arsenotherapy are at best about 85 to 90 per cent "cure" among cases in which treatment is started in the primary stage of the disease and 70 per cent among cases in which treatment

is started in the secondary stage. Primary cases show about 5 to 6 per cent clinical relapse, and secondary cases from 10 to 13 per cent. Perhaps as grave a consideration as the frequency of clinical relapses is the 8 per cent of primary cases and the 15 to 20 per cent of secondary cases that either remain serologically positive or show a serologic relapse, for any late manifestations of the disease which may occur will probably appear among these cases.

No significant differences were found between the results obtained in original infections and those obtained in reinfections. And, as shown in table 5, while the

TABLE 6.—Results Obtained with Massive Arsenotherapy in Early Syphilis, Showing the Estimated Percentage of Cases in Each Final Outcome Following Rapid and Slow Drip with Mapharsen by Quantitative Kahn Test Titer at Time of Treatment

Method of Treatment	Satisfactory		Serologically Fast		Serologic Relapse		Clinical Relapse	
	Titer		Titer		Titer		Titer	
	20	Over	20	Over	20	Over	20	Over
	Units	Less	Units	Less	Units	Less	Units	Less
Rapid drip, mapharsen	83.6	69.0	6.0	8.5	4.4	9.0	6.0	13.5
Slow drip, mapharsen	80.2	72.1	4.4	12.0	7.2	3.3	8.2	12.6

TABLE 7.—Results Obtained with Massive Arsenotherapy in Early Syphilis, Showing the Estimated Percentage of Cases in Each Final Outcome for Each Method of Treatment, by Amount of Arsenical Given

Method of Treatment and Amount of Arsenical Given	Satisfactory	Serologically Fast		Serologic Relapse	Clinical Relapse
		Less	Over		
Slow drip, nearsphenamine					
Less than 4,000 mg.	87.4	6.3	...	6.3	
4,000 mg. and over	88.0	4.8	1.2	6.0	
Slow drip, mapharsen					
Less than 1,200 mg.	76.9	4.8	1.2	17.1	
1,200 mg. and over	75.9	9.7	3.8	10.6	
Rapid drip, mapharsen					
Less than 800 mg.	70.6	9.5	9.0	10.9	
800 mg. and over	82.3	6.5	4.1	7.1	
Multiple injection, mapharsen					
Less than 1,200 mg.	72.4	6.9	4.8	15.9	
1,200 mg. and over	74.2	12.9	...	12.9	
Multiple injection, mapharsen, plus typhoid vaccine					
Less than 800 mg.	72.0	14.8	5.6	7.6	
800 mg. and over	83.0	10.0	...	7.0	
Multiple injection, arsphenamine					
Less than 2,400 mg.	59.2	13.2	3.9	23.7	
2,400 mg. and over	73.6	9.0	7.1	10.3	

reinfections showed both a larger percentage of satisfactory results and a smaller percentage of clinical relapses than did the relapses, the differences were not statistically significant. This is probably due to the small number of reinfections: As might be expected, primary syphilis, first infection, gave much better results than did relapses. However, there was no difference in the results obtained among previously untreated secondary infections and those obtained among patients with secondary manifestations occurring as a relapse after treatment, either routine or intensive in type.

In a considerable number of the cases treated by means of slow and rapid drip with mapharsen, blood specimens were examined at the time of treatment by means of the Kahn quantitative test. With both these methods of treatment it was found that cases whose

starting titer was 20 units or below had significantly more satisfactory results and fewer relapses than did cases with a starting titer higher than 20 units. These results are given in table 6.

In order to investigate the effect of the amount of arsenical administered, the results following each

TABLE 8.—Results Obtained with Massive Arsenotherapy in Early Syphilis, Showing the Estimated Percentage of Cases in Each Final Outcome Following Administration of Slow and Rapid Drip With Mapharsen With and Without Bismuth

Method of Treatment and Administration of Bismuth	Final Outcome			
	Satisfactory	Serologically Fast	Serologic Relapse	Clinical Relapse
Rapid drip, mapharsen				
Bismuth given	92.4	3.8	3.8	...
No bismuth given	70.4	8.4	8.4	12.8
Slow drip, mapharsen				
Bismuth given	72.3	10.9	3.1	13.7
No bismuth given	72.5	8.7	3.7	15.1

method of treatment were analyzed at various dosage levels. Table 7 presents the final outcome for each treatment scheme above and below the dosage levels which gave the largest differences. None of the differences are very great, and none are clearly significant. However, in nearly every case the differences are in the direction of better results with larger doses, and, when all treatments are combined, the difference is significant. In every instance more clinical relapses occurred among the smaller dosage groups.

Bismuth was administered in connection with the intensive treatment course in a portion of the cases in which either rapid or slow drip with mapharsen was given. Table 8 shows the results following these two treatments divided according to whether or not bismuth was given. It can be seen that with rapid drip the use of bismuth improved the results decidedly. Among the patients receiving this drug there were 92.4 per cent satisfactory results, compared with 70.4 per

TABLE 9.—Results Obtained with Massive Arsenotherapy in Early Syphilis, Showing the Estimated Percentage of Satisfactory Results and of Clinical Relapses for Each Method of Treatment, by Age at Time of Treatment

Method of Treatment	Per Cent Satisfactory Results		Per Cent Clinical Relapses	
	Under 25 Years of Age	25 Years of Age and Over	Under 25 Years of Age	25 Years of Age and Over
Slow drip, nearsphenamine	82.2	90.7	8.9	3.7
Slow drip, mapharsen	73.3	81.3	14.5	8.2
Rapid drip, mapharsen	75.5	76.2	11.4	8.6
Multiple injection, mapharsen	67.3	79.8	15.2	10.6
Multiple injection, mapharsen plus typhoid vaccine	68.6	84.2	9.7	2.7
Multiple injection, arsphenamine	58.4	74.1	23.0	9.5
Total, all methods	71.7	81.1	13.6	7.4

cent among those not receiving it. Conversely there were 12.8 per cent of clinical relapses among those not given bismuth and none among those who did get it.

Among the cases treated by slow drip, the results were not so clearcut. When all cases treated by this method were divided only according to whether or not bismuth was given, no significant differences were found. It was noted, however, that bismuth was used more frequently in the treatment of secondary syphilis-

than in primary syphilis and also that among primary cases it was given more frequently to those who were seropositive than to those who were seronegative.

Differences in response to syphilotherapy may be inherent in certain characteristics of the patient population, even though these characteristics are not in any way determined by the disease or its treatment. In seeking to investigate these points the results of intensive therapy were analyzed by race, sex and age.

With regard to age a very definite bias in favor of older patients was found. From table 9 it can be seen that 81.1 per cent of the older group reached a satisfactory outcome as opposed to 71.7 per cent of the younger patients, and whereas only 7.4 per cent of the

tion of clinical relapses as it is in the case of satisfactory results. The racial difference is still apparent, but there seems to be no difference between males and females. The clinical relapse rates are shown for race and sex in table 11. The nonwhite races show a significantly greater predisposition toward infectious relapse than does the white race for all treatments combined. From one sex to another, however, neither is there uniformity of direction in the differences from one treatment method to another nor is there a significant difference observable in all treatments combined.

The outstanding conclusion to be drawn from the foregoing analysis by patient population characteristics is that the group most resistant to treatment was that of young nonwhite females.

The present study is primarily concerned with the therapeutic efficacy of massive arsenotherapy, and the detailed analysis of reactions is not yet complete. The only data concerning treatment complications yet compiled are derived from a hand tabulation of the abstracts available on Aug. 1, 1943. At that time a search was made for cases showing evidence of encephalopathy which advanced to the point of convulsions. It was found that for all types of treatment combined there were 3.2 fatal encephalopathic reactions per thousand courses of treatment and 3.9 nonfatal, a total of 7.1 per thousand. No statistically significant differences could be demonstrated between individual clinics, methods of treatment, sexes or age groups. It was noted, however, that encephalopathy occurred more than twice as frequently among white persons as among nonwhites, and also that this type of reaction appeared to be more frequently fatal among white females than among white males or among nonwhites of either sex.

TABLE 10.—Results Obtained with Massive Arsenotherapy in Early Syphilis, Showing the Estimated Percentage of Satisfactory Results Following Each Method of Treatment, by Race and Sex

Method of Treatment	Race and Sex							
	Race		Sex					
	Non-White				White		Nonwhite	
	White	White	♂	♀	♂	♀	♂	♀
Slow drip, nearsphenamine	91.1	80.6	87.9	....	91.1	....	80.6	....
Slow drip, mapharsen	82.2	70.8	80.7	70.5	88.2	74.7	74.2	66.4
Rapid drip, mapharsen	77.9	74.6	83.8	69.5	86.4	66.7	82.6	66.5
Multiple injections, mapharsen	78.7	70.0	77.2	69.0	77.7	80.7	76.6	62.5
Multiple injections, mapharsen plus typhoid vaccine	84.5	67.5	80.3	64.8	90.1	74.2	73.6	61.0
Multiple injections, arsphenamine	68.2	63.1	64.9	....	68.2	....	63.1	....
Total, all methods	82.1	70.4	80.1	68.5	86.0	74.5	74.6	64.6

TABLE 11.—Results Obtained with Massive Arsenotherapy in Early Syphilis, Showing the Estimated Percentage of Clinical Relapses Following Each Method of Treatment, by Race and Sex

Method of Treatment	Race and Sex							
	Race		Sex					
	Non-White				White		Nonwhite	
	White	White	♂	♀	♂	♀	♂	♀
Slow drip, nearsphenamine	1.5	19.4	7.1	....	1.5	....	19.4	....
Slow drip, mapharsen	7.9	15.5	11.5	12.3	5.6	10.7	16.7	13.9
Rapid drip, mapharsen	15.4	8.1	7.1	13.4	10.2	22.2	5.8	10.4
Multiple injections, mapharsen	11.7	15.8	15.7	11.5	15.9	3.2	15.6	16.1
Multiple injections, mapharsen plus typhoid vaccine	3.7	8.9	7.1	7.0	5.0	1.5	8.6	9.2
Multiple injections, arsphenamine	15.9	17.4	16.9	....	15.9	....	17.4	....
Total, all methods	8.1	13.0	10.5	11.3	7.1	10.0	13.6	12.1

older patients experienced clinical relapses, 13.6 per cent of the younger ones did. These differences are too large to be ascribed to chance.

From table 10 it can be seen that there are both race and sex differences in the response to rapid treatment for syphilis. The proportion of satisfactory results obtained was consistently higher for the white race than for the nonwhite races and was also higher for males than for females. These differences remain significantly great when the four race-sex groups are considered separately: white males show a greater percentage of satisfactory results than nonwhite males; white females than nonwhite females; white males than white females; nonwhite males than nonwhite females.

The pattern of differences between the races and sexes is not so clearcut when considering the propor-

SUMMARY

1. The therapeutic results in a group of 4,351 massive arsenical treatments for syphilis have been studied.
2. It was found that the best results (excluding the highly reactive slow intravenous drip administration of nearsphenamine) followed the use of multiple syringe injection of mapharsen combined with typhoid vaccine.
3. The most effective massive arsenotherapy yields 85 to 90 per cent of satisfactory results in primary syphilis and 70 per cent in secondary syphilis.
4. About 5 to 6 per cent of the primary cases relapsed and 10 to 13 per cent of the secondary cases.
5. Patients treated when the titer of the Kahn quantitative test on the blood was 20 units or below experienced more frequent satisfactory results and fewer clinical relapses than did cases with a titer greater than 20 units.
6. Results were slightly better among patients receiving larger doses of arsenicals than among those receiving smaller doses.
7. The administration of bismuth during the period of treatment appeared to improve the results obtained.
8. The following differences in response to treatment were noted: Patients over 25 years of age responded better than those under 25; males responded better than females; whites responded better than nonwhites.
9. Least satisfactory results to treatment were obtained among young nonwhite females.
10. Acute encephalopathy was observed in 7.1 per thousand treatments. Of these 3.2 per thousand were fatal and 3.9 per thousand were followed by recovery. No difference could be demonstrated between treatments with regard to the frequency of this type of reaction.

THE INITIAL NEUROLOGIC AND PSYCHIATRIC SYNDROME OF PULMONARY GROWTH

MAJOR DR. A. M. MEERLOO, F.R.S.M.
OF THE ROYAL NETHERLAND ARMY

The syndrome described in this article demonstrates the fact that psychologic and somatic phenomena continually merge into one another, and that in pathology it is impossible to separate them.

It is not widely known that patients with a growth in the thoracic cavity often go in the first place to a neurologist. If one bears in mind that the initial complaint which gives rise to so serious a diagnosis is generally of vague neuralgic pains, it is important to consider the subject closely. The anamnesis is characteristic: the apparently healthy patient complains of spreading pains in the back or limbs. Intermittent neurologic signs and symptoms may be present or not. The patient is psychologically somewhat disturbed; his attention is rather closely fixed on his own pains. His intimates or his family doctor send him to the neurologist with a diagnosis of hysteria or neurosis. In the ordinary way the neurologist gives him psychotherapy. The next stage is the x-ray (in the initial phase this may not reveal anything immediately) and with the determination of the blood sedimentation rate the diagnosis is settled. It is however already possible to diagnose with fair certainty an intrathoracic growth before the x-ray gives a clear picture. If one finds, for example, sharp, spreading pains in the right arm and in the chest whether or not with hyperesthesia and abnormal tendon reflexes, and if at the same time the blood sedimentation rate is very much increased, a negative x-ray should not be relied on.

As a summary the following brief remarks should be added. In the case of my series of 9 patients covering a period of four years, it was not possible for the most part to attempt any pathologic research at the seat of the growth. The x-ray diagnosis and the clinical history as a whole were guaranties of the diagnosis. I saw still more of the same type of patient who had had only one consultation with a general practitioner. My impression is that these neurologic phenomena with an initial growth occur quite frequently—strictly speaking the metastases of intrathoracic tumors in the central nervous system come under the foregoing heading also. The pulmonary growth, especially, tends to produce metastases in the brain.

REPORT OF CASES

CASE 1.—A man aged 69 came for consultation because he had recently suffered from neuralgic pains in the right shoulder blade. His wife found him changed, more discontented and more irritable. His son, a doctor, considered that his father was always too ready to complain of his own ills. The neurologic examination was negative. The patient had not grown thinner. An x-ray examination revealed no abnormality in the spinal column or in the upper part of the lungs. Iontophoretic treatment did not relieve the pain. The patient went on a journey abroad in good spirits; on one occasion during the journey he brought up blood stained mucus, to which no attention was paid. With antineuralgic treatment the condition remained bearable. Six months after the first examination he suddenly brought up a lot of blood. The pain had meanwhile become much worse. The blood sedimentation rate increased, there was anemia, and the x-ray examination of the lungs showed a growth on the right hilus. Three months later the patient died.

CASE 2.—A man aged 57 suffered from spreading pains in the left arm. From time to time he had attacks of choking and of tiredness. He had been treated for neuralgic pains for some time, but latterly he had been more and more depressed, let himself go, became irritable; for this reason he was sent by his family doctor to the neurologist. The pains were usually at night, with a tingling feeling in the left hand. There were no motor or sensory disturbances, nor were there any typical centers of pain, apart from pressure on the ribs on the upper left side. The test for angina pectoris by the doctor was negative. A week later, after preliminary antineuralgic treatment, it appeared that the trachea was slightly displaced toward the right. This put us on the right track. The x-ray examination showed a large growth in the left half of the thorax which presumably issued from the first costal arch and pressed on nearly the whole left lung (sarcoma?). The blood sedimentation rate was 124 mm. Fourteen days later the tumor began to grow outward. In spite of x-ray therapy the patient died four months later.

CASE 3.—A man aged 56 suffered for many years from depression complicated by all kinds of neuralgic pains. As his chronic psychosis deteriorated and he became more violent owing to bitterness against his family, he was placed in a hospital for rest therapy. Examination revealed a slight anemia and a blood sedimentation rate of 60. Profiting by previous experiences and in view of the neuralgic pains in his chest and arms, an x-ray examination was made, with negative results. On these grounds it was decided to give a mild course of barbital, after which the patient felt psychologically much better. After two months he had a relapse, but his condition was still such that he could be nursed at home. Six months later the neuralgic pains were worse; they spread down the right arm and the right side of the thorax. The blood sedimentation rate was now 66. Eight months later came the first hemoptysis. When fresh x-ray films were taken a big pulmonary growth could be seen stretching from the right hilus. Nine months later the pains were more severe, especially at night, waves of pain running through the right hand and arm. There were no neurologic signs. In the tenth month there was slight paralysis in the right hand and arm, with edema of the hand, arm and head. A week later the patient died suddenly in his sleep.

CASE 4.—The patient's illness was announced by apparent sciatic pains, for which he was treated for over six months. The general health was good, but his family complained of his "hysterical" behavior; that is to say, he became more childish, tried to attract attention to his illness and claimed to suffer from more disturbances of functions than was actually the case. On examination a positive symptom of Laségue was found with atrophy of the right calf, but—and this did not belong to the sciatic picture—a Babinski reflex of the soles of the feet and increased reflexes. At first both patient and family set themselves against clinical observation and lumbar puncture; and because the hysterioid depressive syndrome dominated, less attention was paid to neurologic signs. When the patient complained of more pain and neuralgic pains spread to the neck, the family agreed to clinical observation. Here too the x-ray revealed the diagnosis—a large growth at the hilus of the lung, probably growing in the spinal column, while at the third and fourth vertebrae of the neck there was actually a metastasis. The blood picture showed a simple anemia; the blood sedimentation rate was very high (110 after one hour).

CASE 5.—This case is very much akin to the preceding one. It also began with a sciatic syndrome, but it appeared easier to understand as there were metastases in the third, fourth and fifth lumbar from a bronchial carcinoma in the right upper lobe. Here also I was initially called into consultation for psychosis in connection with the sciatic symptoms. The man was childish, negative, depressed. The condition of the patient could not be ameliorated, and the diagnosis was confirmed by clinical examination after the doctor had really convinced the patient that it was necessary. The blood sedimentation point was 91 mm. in the first hour; there was no anemia. This patient also died one and one half months after admission in a state of cachexia.

CASE 6.—Here the diagnosis was more difficult, because the illness began clearly with pains and paralysis of the left arm. The patient was a man aged 67. At the first examination the reflexes in the paralyzed arm were increased, the pupils reacted rather slowly and there were indications of venereal disease in the anamnesis. For these reasons a thorough examination was considered necessary. At the clinical examination, however, no clues on which to base such an enquiry were found; blood and liquor reactions were negative, the x-ray film of the skull was normal, there were no abnormalities in ventricular pressure, blood pressure and renal functions were normal. We were faced with this problem: we had not yet considered the pathologic phenomena which he certainly showed, a blood sedimentation rate of 56 mm. and anemia. In the hospital the patient coughed up blood stained phlegm for the first time. An x-ray film of the lung was then taken and in the left apex of the lung a distinct pressure on the plexus had produced the phenomena already noted. The general condition of the patient remained good for a long time; there were no pathologic developments. A year passed before the patient died.

CASE 7.—A transport worker aged 52 had complained for over a year of rheumatic pains from the left elbow to the neck. The neurologist was consulted as to the possibility of a neuritis in the plexus. From time to time the finger tips were swollen and painful. On admission to the hospital it appeared that he also had pains in the upper part of his chest, and there was a sporadic coughing up of purulent sputum. A year later in another hospital rib section on account of empyema was performed. From the x-ray it appeared that the whole thorax was deeply shadowed and the radiologist suspected multiple tumors. After examination with iodized oil a complete stoppage was found in the left main bronchus at the bifurcation. There was anemia and a blood sedimentation rate of 87 mm. In the sputum there were no tubercle bacilli and no pneumococci, but many streptococci. Electrocardiographic examination was negative. One and a half months after admission to the hospital the patient died after the usual cachectic phenomena had appeared. At the autopsy it appeared that there was a carcinoma spreading from the left lung with metastases in the other lung, pleuritis carcinomatosa, and metastases in both kidneys, along the spinal column and in the liver.

The next 2 patients came to my notice in the confusion and excitement shortly after the German occupation, and for that reason the initial phenomena were all the more difficult to interpret.

CASE 8.—A woman aged 52, who had suffered in the bombardment of Rotterdam, was thereafter depressed and reserved, and five weeks later she came under my care for a sudden attack of asthma and traces of nervousness. She was first treated with sedatives, but after two weeks she had another attack of asthma. This gave rise to the taking of an x-ray film; a tumor of the lung was visible. She had a blood sedimentation rate of 110. The illness lasted six months, the psychosis remaining right up to the last.

CASE 9.—A man aged 44 was thrown against a wall by blast and afterward complained of pains in the shoulder and tingling in the fingers of the right hand. In the same way there was a certain dulness and apathy. The shoulder was x-rayed, but this produced no clues. The psychologic disintegration increased, neurologic symptoms slowly emerged and the reflexes decreased. The blood sedimentation rate was too high, and in view of earlier experiences a diagnosis of intrathoracic tumor was decided on. After six weeks' treatment the patient died very suddenly. He had shown no signs of lung symptoms. At the autopsy a primary lung carcinoma was revealed.

COMMENT

If we analyze the case histories of these people suffering from growths in or near the lung, who in the early stages come to the nerve specialist, we must direct our attention to the following facts:

The Psychologic Symptoms.—The psychiatrist ought to be able to establish the diagnosis of one or another

bodily process on the psychologic picture alone. There is unfortunately no typical psychologic process belonging to distinct organic lesions. There are, however, distinct syndromes which fasten suspicion on a bodily origin. Hysterical depression in the presenile period is significant, even before the onset of arteriosclerosis of the central nervous system. Among my 9 patients, in whom there was a certain negativism along with the syndrome, we must ascribe the psychologic symptoms to a toxic disorder of the central nervous system.

The Pain.—The pain was intense in all the cases. It was not only local but was spread over all parts of the body. This is in accordance with the toxic etiology of neuralgia, above all in those cases in which peripheral neurologic signs appeared. Here also factors connected with abnormal pressure on the sympathetic chain must be taken into account. One of my patients experienced the most intense pain a few days before it was clear from the congestion in the arm that there was pressure on the big vessels. In other cases (2 and 4) in which the tumor was already very big and the pain came later, we ought to have been able to establish the position, owing to the pressure on and erosion of the neighboring skeletal parts. The symptom of neuralgic pain pointed at least as often to a general disorder as to a specific involvement of the sensitive nerve tissue.

OTHER INITIAL SYMPTOMS OF GROWTH IN THE LUNG

Most growths in the lungs will show their true character without neurologic and psychologic clues. None of my patients had a growth beginning with hemoptysis, and among a few there was no instance of hemoptysis. It will more often happen that these patients die without any suspicion of pulmonary disease. A man aged 53 whom I saw in the last stages of his illness and who, because of his neurologic symptoms, paralysis of the arm and leg, was thought to be suffering from acute multiple sclerosis, died suddenly with hemoptysis, there being unfortunately no possibility of x-ray examination. In the initial stages also there was no cachexia among my patients. In all these cases there was an increased blood sedimentation rate from the first examination.

SUMMARY

Nine persons suffering from pulmonary growths consulted a psychiatrist and neurologist concerning their initial symptoms. Violent neuralgic pains with a negative hysterical depression and a raised blood sedimentation rate are a characteristic triad of symptoms demanding an immediate radiologic examination of the lungs. The difficulty of diagnosis lies in the initial psychologic interpretation of the symptoms.

Blood Transfusion in Modern Times.—Scientific use of transfusion in modern times may be traced to James Blundell (1790-1877). Having been much agitated over the loss of many patients through uncontrollable puerperal hemorrhage, he first experimented on animals which had seemingly bled to death and were revived by blood taken from animals of the same species. He then proceeded to investigate the possibilities of transfusion in cases of human hemorrhage. It should be noted here that before Blundell experiments were made by means of bladders fastened to quills; hypodermic needles were unknown. Blundell experimented with various instruments and developed in 1818 a syringe with a three way valve.—Gordon, Benjamin Lee: *The Romance of Medicine*, Philadelphia, F. A. Davis Company, 1944.

accelerated to a high velocity by a high potential difference as soon as they leave the cathode. They are then subjected to a magnetic (or electrostatic) field which acts as a condenser lens and controls the convergence of the electron rays irradiating the specimen. This beam passes through the object, through the magnetic (or electrostatic) objective lens and projector lens, finally to form the image on the fluorescent viewing screen or photographic plate. Electrons which pass through the object undeflected of course contribute to the brightness of the image; any electrons which are sufficiently deflected in the object so that they do not pass through a small aperture in the middle of the objective lens do not contribute to the brightness of the image. The image actually formed, therefore, is essentially a record of the amount of scattering of each electron pencil which traverses the object, and this scattering is to a first approximation proportional to the density times the thickness of matter traversed.

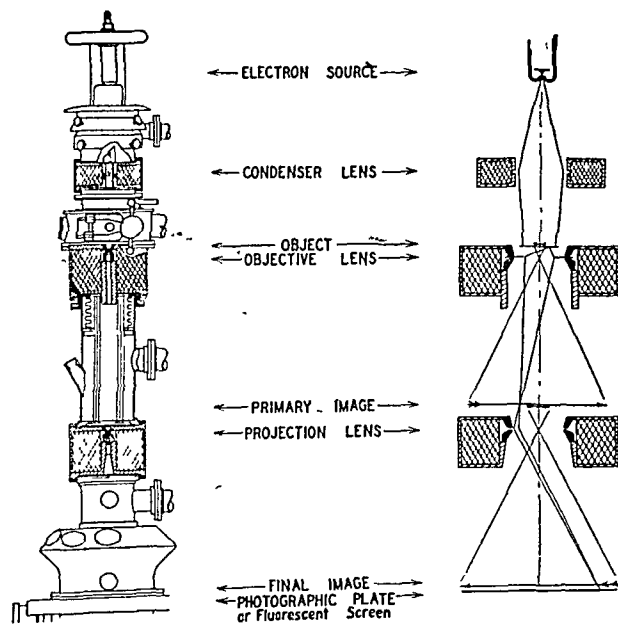


Fig. 1.—The electron microscope. On the left is a scale drawing and on the right a schematic diagram of the instrument showing the arrangement of lenses and the formation of images (After Anderson,⁴ fig. 1.)

Although the mechanism of image formation is different, electron micrographs may therefore be considered as analogous to x-ray pictures, the darkness and brightness depending on the thickness and density of the specimen. Electron pictures resemble x-ray pictures in another important respect, i. e. that the entire thickness of the usual specimen is in focus. The electron micrograph is thus a projection of the total thickness of the field under examination; this lack of a critical focal plane may cause the illusion of two separate objects, one of which overlies the other, appearing as parts of one object in the electron micrograph.

Since air itself scatters electrons, the interior of the electron microscope is kept at a high vacuum. The bacteria or other specimens are mounted, usually unstained, on a thin collodion film. Some shrinkage of parts of the bacterial cell, in particular the fluid or potentially fluid inner protoplasm, frequently occurs, as a result of the unavoidable drying; some distortion of the cell and its parts, due to drying against the mount, may also occur. We have not seen evidence of appreciable alteration of such small objects as bacteria by action of the electron beam itself.

THE STRUCTURE OF THE BACTERIAL CELL AS SHOWN BY THE ELECTRON MICROSCOPE

Bacteria are cells, with structurally differentiated parts. A cell wall, structurally distinct from the inner protoplasm, can be detected in electron pictures of each of the kinds of bacterium thus far adequately studied; this includes most micro-organisms pathogenic for man; cocci and rod forms, both gram positive and gram negative and spiral forms (e. g. figs. 2, 3, 4, 5, 6, 17, 22, 26 and 42). Differentiation within the inner protoplasm can be detected in many species in the form of dense spheroidal (fig. 7) or discoidal (fig. 8) granules or of less well defined areas of greater or lesser density (fig. 9). Spores form within the protoplasm of sporulating species (fig. 10); flagella are demonstrable on motile species. Nucleoprotein demonstrable chemically within the bacterial cell can be seen as localized under certain, but not all, conditions in what has been interpreted as a simple nucleus (fig. 11). Capsules in certain species such as the pneumococcus (fig. 12) and extracellular slime in others, such as *Streptococcus pyogenes*,⁵ are demonstrable outside the bacterial cell wall.

Bacterial Cell Wall and Inner Protoplasm.—The bacterial cell wall is in the solid state; it maintains its shape and position with relatively little alteration under conditions of drying or mechanical injury to the bacterial cell. The inner protoplasm with its limiting surface is either fluid or a gel which readily passes into the sol state, as is evidenced by the frequency with which the protoplasm appears shrunken away from the cell wall in dried specimens and escapes from the cell wall following injury of the bacterial cell. Bacterial cells may be broken by intense sonic vibration. After such treatment many of the cell walls appear as "ghosts" from which the inner protoplasm has escaped (fig. 2), and jagged lines of fracture of the cell wall may be found⁷ (fig. 13). Shrinkage or escape of inner protoplasm from the cell wall may be brought about by appropriate chemical reagents⁸ (figs. 14, 15 and 16). Intact cells and "ghosts" of autolyzed cells⁷ may be found together in preparations particularly from aging cultures (fig. 17).

In bacteria which are not quite completely divided, and in those which form chains, such as *Streptococcus pyogenes* (fig. 18) or clusters such as *Staphylococcus aureus* (fig. 19), the bacterial cell walls can be seen to be continuous from cell to cell; a connecting strand of protoplasm may or may not be present between the adjacent cells according to the completeness and nature of the cell division.

Differentiations Detectable Within the Protoplasm.—The inner protoplasm itself may appear homogeneous in electron pictures. Or inhomogeneities may be apparent in the inner protoplasm, as in micrographs of strains of *Fusobacterium*,⁹ *Treponema pallidum* (fig. 7), *Mycobacterium tuberculosis*¹⁰ (fig. 21), *Corynebac-*

5. Marton, L.: The Electron Microscope: A New Tool for Bacteriological Research, *J. Bact.* **41**: 397-413 (March) 1941, figure 6.

6. Mudd, S., and Lackman, D. B.: Bacterial Morphology as Shown by the Electron Microscope: I. Structural Differentiation Within the Streptococcal Cell, *J. Bact.* **41**: 415-420 (March) 1941.

7. Mudd, S.; Polevitzky, K.; Anderson, T. F., and Chambers, L. A.: Bacterial Morphology as Shown by the Electron Microscope: II. The Bacterial Cell Wall in the Genus *Bacillus*, *J. Bact.* **42**: 251-264 (Aug.) 1941.

8. Morton, H. E., and Anderson, T. F.: The Morphology of *Leptospira* Icterohemorrhagiae and *L. Canicola* as Revealed by the Electron Microscope, *J. Bact.* **45**: 143-146 (Feb.) 1943. Mudd and Anderson.

9. Mudd, S.; Polevitzky, K.; Anderson, T. F., and Kast, C. C.: Bacterial Morphology as Shown by the Electron Microscope: III. Cell Wall and Protoplasm in a Strain of *Fusobacterium*, *J. Bact.* **44**: 361-366 (Sept.) 1942.

10. Mudd, S., Polevitzky, K., and Anderson, T. F.: Bacterial Morphology as Shown by the Electron Microscope: IV. Structural Differentiation Within the Bacterial Protoplasm, *Arch. Path.* **34**: 199-207 (July) 1942.

terium diphtheriae¹¹ (fig. 8) and others. These inhomogeneities in the inner protoplasm may be of several kinds. In *Fusobacterium* (fig. 20), for instance, certain areas of the protoplasm may be denser than other areas,⁹ and such characteristic differences may even be apparent in stained preparations¹² viewed with the light

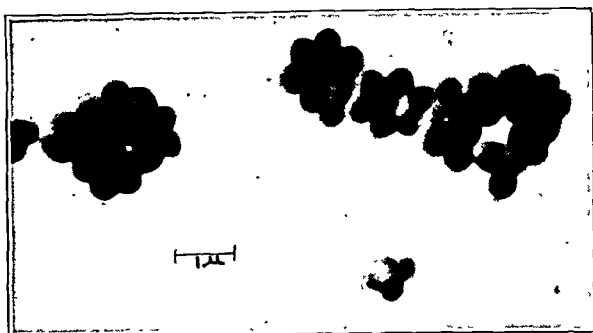


Fig. 3.—*Staphylococcus aureus*. The light appearing cell walls are particularly clearly shown surrounding the dark inner protoplasm of three of the central cluster of four cells. Reduced from an electron micrograph with a magnification of 10,000 diameters.

microscope. In other species definite spheroidal or discoidal granules of high density may be seen within the protoplasm; such granules have been recorded notably with *Mycobacterium tuberculosis* (fig. 21), *Treponema pallidum* (fig. 7), *Corynebacterium diphtheriae* (fig. 8) and *Staphylococcus flavocyaneus*¹³ (fig. 11). The significance of these granules is not clear in most species. In *Staphylococcus flavocyaneus*, however, microchemical and cytologic evidence¹³ strongly suggests the interpretation of these protoplasmic granules as simple nuclei; it seems probable that a similar interpretation may become appropriate for protoplasmic granules in other species, but this question had best be left open at the present, pending further evidence.

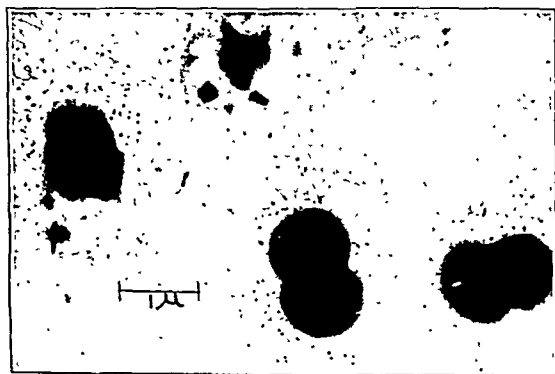


Fig. 4.—*Neisseria gonorrhoeae*. Two diplococcus pairs are intact; one pair is cytolized. Magnification 11,000 diameters. Reproduced through courtesy of Dr. H. E. Morton.

Inhomogeneities in the bacterial protoplasm may also be produced as artefacts due to coagulation, drying or partial cytolysis, as is of course obvious. Such artefacts

11. Morton, H. E., and Anderson, T. F.: Electron Microscopic Studies of Biological Reactions: I. Reduction of Potassium Tellurite by *Corynebacterium diphtheriae*, *Proc. Soc. Exper. Biol. & Med.* **46**: 272-276 (Feb.) 1941.

12. Varney, P. L.: The Serological Classification of Fusiform Bacilli, *J. Bact.* **13**: 275-314 (April) 1927. Hine, M. K., and Bury, G. P.: Morphological and Cultural Studies of the Genus *Fusiformis*, *ibid.* **34**: 517-533 (Nov.) 1937.

13. Knaysi, G., and Mudd, S.: The Internal Structure of Certain Bacteria as Revealed by the Electron Microscope: A Contribution to the Study of the Bacterial Nucleus, *J. Bact.* **45**: 349-359 (April) 1943.

are more easily produced in the inner protoplasm than in the cell wall, because of the greater fluidity of the protoplasm. Knaysi¹⁴ has demonstrated that in ordinary bacteriologic specimens (viewed with the light microscope) it is only the inner protoplasm and its limiting membrane which are stained and visible. The cell wall is unstained and invisible unless prepared by special mordant and staining technic. Cell wall and protoplast with protoplasmic membrane are shown particularly clearly in figure 22.¹⁵

The Capsule.—The pneumococcus capsule has been demonstrated in electron micrographs¹⁶ (fig. 12) as a gel of low density outside of and closely enveloping the cell wall, the cell wall in turn enveloping the bacterial protoplasm with its outer limiting membrane. In the specific capsular swelling reaction the interstices of this capsule are permeated by rabbit immune serum; increase in the thickness and density of the capsule results¹⁷ (figs. 23 and 24).

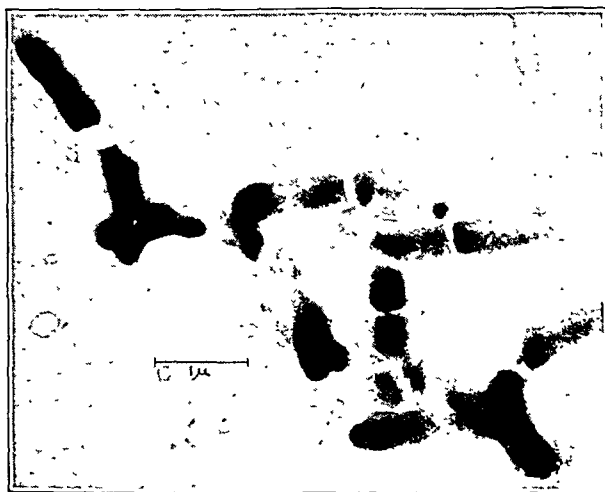


Fig. 8.—*Corynebacterium diphtheriae*. Discoidal dense granules can be seen near ends of the cells. The protoplasm is shrunken away from the cell walls of several cells. Reduced from an electron micrograph with a magnification of 26,500 diameters. Courtesy of Dr. H. E. Morton.

Flagella.—Flagella are beautifully shown in electron micrographs of motile bacterial species without the necessity of using any mordant or stain. These flagella may occur singly, as on cells of *Vibrio cholerae*¹⁸ (figs. 14, 15 and 16), may occur all around the bacterial cell, as is the case with *Eberthella typhosa*¹⁹ (fig. 25) or *Clostridium tetani* (figs. 17, 26 and 27), or may occur in tufts, as is the case on cells of *Treponema pallidum* (figs. 6, 7 and 28). *Treponema*

14. Knaysi, G.: Cytology of Bacteria, *Botan. Rev.* **4**: 83-112 (Feb.) 1938; Observations on the Cell Division of Some Yeasts and Bacteria, *J. Bact.* **41**: 141-154 (Feb.) 1941; Elements of Bacterial Cytology, Ithaca, N. Y., Comstock Publishing Company, 1944.

15. Johnson, F. H.: Observations on the Electron Microscopy of *B. Cereus* and Tyrothricin Action, *J. Bact.* **47**: 551-557 (June) 1944.

16. Mudd, S.; Heinmets, F., and Anderson, T. F.: Bacterial Morphology as Shown by the Electron Microscope: VI. Capsule, Cell Wall and Inner Protoplasm of *Pneumococcus* Type III, *J. Bact.* **46**: 205-211 (Aug.) 1943.

17. Mudd, S.; Heinmets, F., and Anderson, T. F.: The *Pneumococcal* Capsular Swelling Reaction, Studied with the Aid of the Electron Microscope, *J. Exper. Med.* **78**: 327-332 (Nov.) 1943. Johnson, F. H., and Dennison, W. L.: The Volume Change Accompanying the Quelling Reaction of *Pneumococci*, *J. Immunol.* **48**: 317-323 (May) 1944.

18. Mudd, S., and Anderson, T. F.: Selective "Staining" for Electron Micrography: The Effects of Heavy Metal Salts on Individual Bacterial Cells, *J. Exper. Med.* **76**: 103-108 (July) 1942.

19. The flagella of *Eberthella typhosa* are undoubtedly peritrichate. However, Pupper (Microcinematography of the Agglutination of Typhoid Bacilli, *J. Bact.* **42**: 395-409 [Sept.] 1941) has shown that in locomotion the flagella of each typhoid bacillus are plated together to form a corkscrew shaped "tail," which is the actual locomotor organ.

BACTERIA—MUDD AND ANDERSON

564

pallidum was described as without flagella until flagella were demonstrated in electron micrographs.²⁰

Spores and Sporelike Bodies.—Spores form within the protoplasm of the cells of bacteria of the genus *Clostridium* (the tetanus gas gangrene group) and of the genus *Bacillus*,⁷ which includes *Bacillus anthracis*. In young cultures the protoplasm of the bacterial cells may appear homogeneous (fig. 26). In older cultures much of the protoplasm appears to be condensed into the spores (figs. 10 and 27), which appear as exceedingly dense bodies within a protoplasm of reduced density. Subsequently the spore-mother cell shrivels up (fig. 29) and the spore is freed (fig. 30).

Electron micrographs²¹ of *Treponema pallidum* in a number of instances have shown minute bodies of high density attached to the spirochetal cells (figs. 31 and 32); these dense bodies may be closely applied to the sides of the spirochetes or may be attached to the side of the spirochetal cell by short stalks or may be found free. These bodies have been described by a long series

Manouélian.²⁴ If this interpretation is correct, it might aid, as Ingraham has pointed out, in explaining puzzling aspects of latency, drug resistance and recurrence in syphilis.

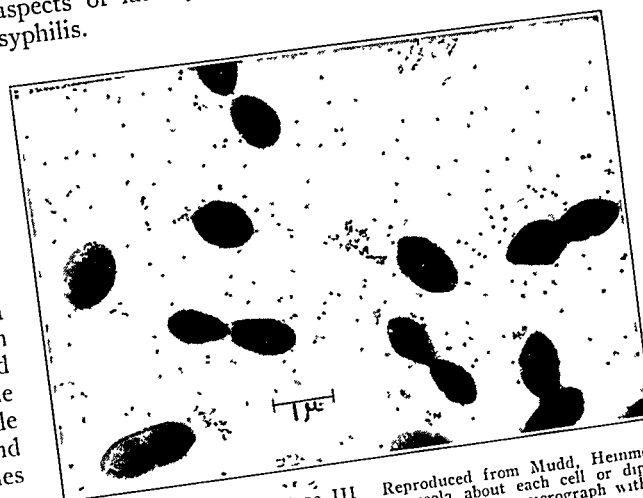


Fig. 12—*Pneumococcus* type III. Reproduced from Mudd, Heinmets and Anderson¹¹ (fig. 1). The delicate areola about each cell or diplococcus pair is the capsule. Reduced from an electron micrograph with a magnification of 11,000 diameters.

It is of interest to consider whether the structural differentiations thus far revealed by the electron microscope afford a clue to the nature of the organization



Fig. 10—*Bacillus anthracis*. Two chains of vegetative cells, spores appear to be forming in three cells of the lower chain, one extracellular spore is seen from the lower chain. Slightly reduced from an electron micrograph with a magnification of 3,340 diameters.

of investigators; the terms applied to them, "knospes" or "buds" (Meirowsky), "sporelike spherical bodies" (Noguchi), "granules spirochétogènes" (Manouélian), express the interpretation often explicitly made that these are asexual resting or resistant bodies like spores capable of reproducing asexually the normal spirochetal cell. The very impressive accumulation of evidence supporting this interpretation has been reviewed by Meirowsky²² and Ingraham²³ and more recently by



Fig. 17—*Clostridium tetani*, 10 day old culture. One intact cell is undergoing unequal division to produce a coccoid cell. The other cells are more or less cytolized. Slightly reduced from an electron micrograph with a magnification of 9,300 diameters.

underlying the amazingly diverse and intricate chemical processes which occur within the minute dimensions of the bacterial cell. *Streptococcus pyogenes*, for

20 Wile, U. J., and Kearney, E. B. The Morphology of *Treponema pallidum* in the Electron Microscope. *Demonstration of Flagella*, J. A. M. A. **122**: 167-168 (May 15) 1943. Mudd, S., Polevitzky, K., and Anderson, T. F. Bacterial Morphology as Shown by the Electron Microscope. V. *Treponema pallidum*, T. Macrodentium and T. Microdentium, scope. **46**: 15-24 (July) 1943, footnote 10. Wile, Pickard and Kearney.
21 Wile, U. J., Picard, R. G., and Kearney, E. B. The Morphology of *Spirochaeta pallida* in the Electron Microscope, J. A. M. A. **119**: 880-881 (July 11) 1942. Marton, H. L., and Anderson, T. F. Some Morphologic Features of the Nichols Strain of *Treponema pallidum* as Revealed by the Electron Microscope, *Am. J. Syph., Gonorr. & Ven. Dis.* **26**: 565-573 (Sept.) 1942. Mudd, Polevitzky, and Anderson.
22 Meirowsky, E. *Spirochaeta pallida*, Schaudinn, nebst Bemerkungen über den Entwicklungskreis der *Treponema pallidum* (April) **77**: 429-430 (March) 1930.
23 Ingraham, N. R., Jr. The Life History of the *Treponema pallidum*. A Critical Review of the Literature. *Am. J. Syph.* **16**: 155-189 (April) 1932.

24 Manouélian, Y. Etude morphologique de *Spirochaeta pallida* modes de division; spirochetogène syphilitique, *Ann. Inst. Pasteur* **64**: 439-455 (May) 1940.

instance, elaborates a characteristic type specific protein, M, whose locus is at least in part at the surface of the streptococcus cell wall;²⁵ the majority of strains thus far analyzed²⁶ possess a second type specific agglutigen T of unknown chemical composition; strains of *Streptococcus pyogenes* elaborate a carbohydrate C characteristic of the serologic group,²⁷ protein or nucleoprotein components which cross-react with proteins of streptococci of other groups and of pneumococci²⁸ and nucleic acids of both the d-ribose and desoxyribose types.²⁹ *Streptococcus pyogenes*, given the necessary growth accessories and amino acids,³⁰ elaborates the enzyme systems required for aerobic and anaerobic respiration. *Streptococcus pyogenes* in its mucoid phase secretes an extracellular mucoid material, hyaluronic acid,³¹ which appears to be identical with a polysaccharide of the mammalian umbilical cord, the vitreous humor³² and an interfibrillar substance of the corium. *Streptococcus pyogenes* produces at least three demonstrably distinct physiologically active metabolites which are antigenic: the erythrogenic or skin toxin,³³ the streptococcus hemolysin³⁴ (streptolysin) and fibrinolysin,³⁵ which, acting conjointly with a lytic agent in human serum,³⁶ causes lysis of human and rabbit fibrin. Certain strains at least of *Streptococcus pyogenes* elaborate an enzyme, hyaluronidase, capable of depolymerizing and hydrolysing hyaluronic acid;³⁷ this hyaluronidase is known as a "spreading factor" because of its action in facilitating the dissemination of foreign material, doubtless including bacteria and their products, in the corium.³⁸ *S. pyogenes* liberates a "lethal agent"³⁹ of small molecular size.

25. Lancefield, R. C.: Studies on the Antigenic Composition of Group A Hemolytic Streptococci: I. Effects of Proteolytic Enzymes on Streptococcal Cells, *J. Exper. Med.* **78**: 465-476 (Dec.) 1943.

26. Lancefield, R. C.: Type Specific Antigens M and T of Matt and Glossy Variants of Group A Hemolytic Streptococci, *J. Exper. Med.* **71**: 521-537 (April) 1940. Lancefield, R. C., and Stewart, W. A.: Studies on the Antigenic Composition of Group A Hemolytic Streptococci: II. The Occurrence of Strains in a Given Type Containing M but no T Antigen, *ibid.* **79**: 79-88 (Jan.) 1944.

27. Lancefield, R. C.: A Serological Differentiation of Human and Other Groups of Hemolytic Streptococci, *J. Exper. Med.* **57**: 571-595 (April) 1933. Zittle, C. A., and Harris, T. N.: The Antigenic Structure of Hemolytic Streptococci of Lancefield Group A: X. The Purification and Certain Properties of the Group Specific Polysaccharide, *J. Biol. Chem.* **142**: 823-833 (Feb.) 1942.

28. Lancefield, R. C.: The Antigenic Complex of Streptococcus Hemolyticus: II. Chemical and Immunological Properties of the Protein Fractions, *J. Exper. Med.* **47**: 469-480 (March) 1928. Mudd, S., and Wiener, M.: The Antigenic Structure of Hemolytic Streptococci of Lancefield Group A: XI. Relationships of the Nucleoproteins of Some Species of Streptococci and Pneumococci, *J. Immunol.* **45**: 21-28 (Sept.) 1942.

29. Sevag, M. G.; Smolens, J., and Lackman, D. B.: The Nucleic Acid Content and Distribution in Streptococcus Pyogenes, *J. Biol. Chem.* **134**: 523-529 (July) 1940.

30. Bernheimer, A. W., and Pappenheimer, A. M., Jr.: Factors Necessary for Massive Growth of Group A Hemolytic Streptococcus, *J. Bact.* **43**: 481-491 (April) 1942. Bernheimer, A. W.; Gillman, W.; Hottel, G. A., and Pappenheimer, A. M., Jr.: An Improved Medium for the Cultivation of *Streptococcus pyogenes*, *ibid.* **43**: 495-498 (April) 1942.

31. Kendall, I. L.; Bernheimer, A. W., and Dawson, M. H.: A Serologically Inactive Polysaccharide Elaborated by Mucoid Strains of Group A Streptococcus, *J. Biol. Chem.* **118**: 61-69 (March) 1937. Kass, J. V.: The Role of the Mucoid Polysaccharide in Virulence of Group A Hemolytic Streptococci, *ibid.* **130**: 330 (March) 1944.

32. Meyer, K.; Dubos, R., and Smyth, E. M.: The Hydrolysis of the Polysaccharide Acids of Vitreous Humor, of Umbilical Cord and of Streptococci by the Autolytic Enzyme of Pneumococcus, *J. Biol. Chem.* **118**: 71-78 (March) 1937.

33. Dick, G. F., and Dick, Gladys H.: A Skin Test for Susceptibility to Scarlet Fever, *J. A. M. A.* **82**: 265-266 (Jan. 26) 1924. Dochez, A. R., and Sherman, L.: The Significance of Streptococcus Hemolyticus in Scarlet Fever, *ibid.* **82**: 542-544 (Feb. 16) 1924. Hottel, G. A., and Pappenheimer, A. M., Jr.: A Quantitative Study of the Scarlet Fever Toxin-Antitoxin Flocculation Reaction, *J. Exper. Med.* **74**: 545-556 (Dec.) 1941.

34. Smyth, C. V., and Harris, T. N.: Some Properties of a Hemolysin Produced by Group A β -Hemolytic Streptococci, *J. Immunol.* **38**: 283-300 (April) 1940.

35. Tillett, W. S., and Garner, R. L.: The Fibrinolytic Activity of Hemolytic Streptococci, *J. Exper. Med.* **58**: 485-502 (Oct.) 1933.

36. Milstone, H.: A Factor in Normal Human Blood Which Participates in Streptococcal Fibrinolysis, *J. Immunol.* **42**: 109-116 (Oct.) 1941.

37. Meyer, K.; Chaffee, E.; Hobby, G. L., and Dawson, M. H.: Hyaluronidases of Bacterial and Animal Origin, *J. Exper. Med.* **73**: 305-328 (March) 1941.

38. Chain, E., and Duthie, E. S.: Identity of Hyaluronidase and Spreading Factor, *Brit. J. Exper. Path.* **21**: 324-338 (Dec.) 1940. McClean, D.: The Capsulation of Streptococci and Its Relation to Diffusion Factor (Hyaluronidase), *J. Path. & Bact.* **53**: 13-27 (July) 1941.

(Footnotes continued in the next column)

The minute streptococcus cell therefore achieves chemical syntheses which cannot be duplicated in the best equipped chemical laboratories in existence. The concurrent and orderly occurrence of so many chemical

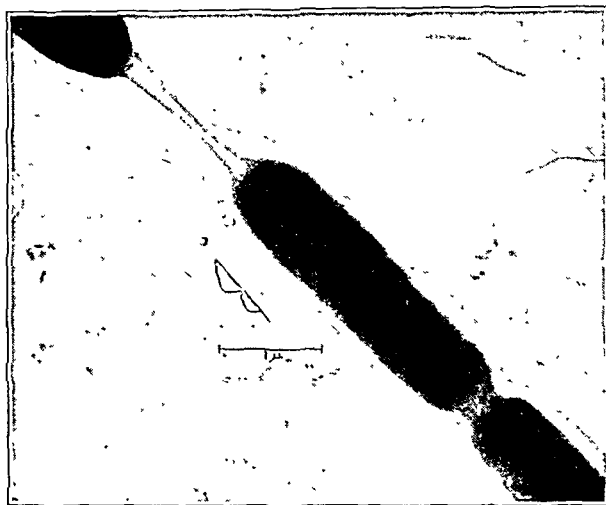


Fig. 22.—*Bacillus cereus*. Reproduced from Johnson.³³ A "transparent" cell wall encloses the dense inner protoplasm. The cells in early division are joined by a relatively broad band of protoplasm; the cells in more advanced division are connected by a delicate strand of protoplasm (plasmodesmid). Reduced from an electron micrograph with a magnification of 40,000 diameters.

processes within minute dimensions must presuppose some pattern of organization of materials even though this organization is on a molecular scale. It must be admitted that the structural differentiations thus far revealed seem gross and crude in comparison to the

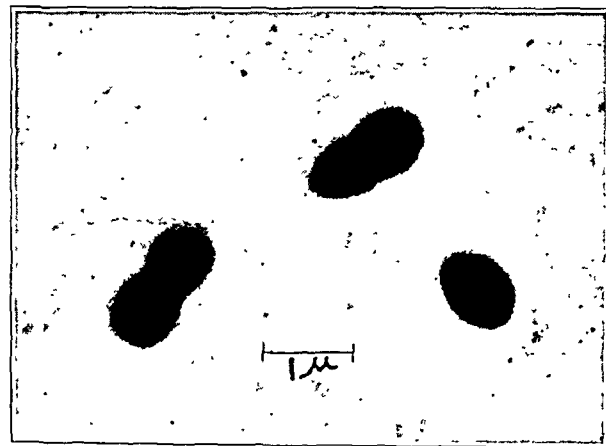


Fig. 23.—Pneumococcus type I. Reproduced from Mudd, Heinmets and Anderson³⁷ (fig. 14). Pneumococcus capsule swollen by exposure for three minutes to diluted rabbit antiserum containing specific antibody. Slightly reduced from an electron micrograph with a magnification of 14,000 diameters.

intricate ultramicroscopic organization which one must suppose to exist as a physical basis for the functioning even of bacterial cells. Possibly the discovery of "heavy particles" of complex composition in *S. pyogenes* by Sevag, Smolens and Stern⁴⁰ (see also Stern⁴¹) or of

39. Harris, T. N.: A Lethal Agent Produced by the Hemolytic Streptococcus, *J. Bact.* **43**: 739-748 (June) 1942.

40. Sevag, M. G.; Smolens, J., and Stern, K. G.: Isolation and Properties of Pigmented Heavy Particles from Streptococcus Pyogenes, *J. Biol. Chem.* **139**: 925-941 (June) 1941.

41. Stern, K. G.: Studies on Macromolecular Particles Endowed with Specific Biological Activity, from Frontiers in Cytochemistry, Biological Symposia **10**: 291-321, Lancaster, Pa., 1943.

the minute structural units in the protoplasm of phage lysed *E. coli* cells by Luria, Delbrück and Anderson⁴² or of the thixotropic gel-like organization of the axoplasm of nerve cells of the squid by Richards, Steinback and Anderson⁴³ may afford first glimmers of light as to what the nature of this pattern of organization may ultimately prove to be.

THE MORPHOLOGY OF RICKETTSIAS AND PLEURO-PNEUMONIA-LIKE MICRO-ORGANISMS

Epidemic and endemic typhus fevers, the spotted fevers, Q fever and scrub typhus or tsutsugamushi disease are caused by pathogenic rickettsias. These are⁴⁴ "small, often pleomorphic, gram negative, bacterium-like organisms, living and multiplying in arthropod tissues, behaving as obligate intracellular parasites, and staining lightly with aniline dyes." *Rickettsia prowazeki*, the causal agent of typhus, in its most characteristic form appears as a minute diplobacillus, each member of the diploid form averaging about 0.6 by 0.3 micron.

The rickettsias may be regarded as intermediate in the biologic scale between bacteria and the viruses. Thus in size, shape and staining characteristics they are like little pleomorphic bacteria; they resemble the viruses in their obligate intracellular parasitism. They may also "be regarded as intermediate in their degree of adaption to intracellular conditions, since they grow best in cells which are metabolizing slowly." For a fuller discussion the reader is referred to the review of Pinkerton.⁴⁴

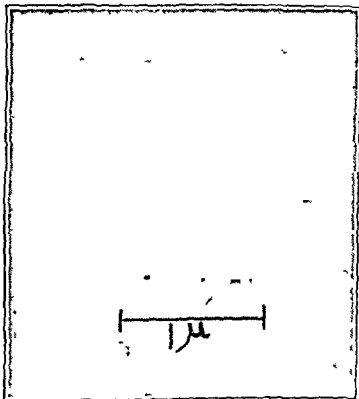


Fig. 24.—*Pneumococcus* type I treated for thirty seconds with undiluted homologous rabbit antiserum; more advanced stage of swelling than in figure 23. Magnification 19,200 diameters

Plotz, Smadel, Anderson and Chambers.⁴⁵ The essential findings have been confirmed by Weiss.⁴⁶ These electron pictures show that rickettsias (figs. 33, 34 and 35), like bacteria, are cells with a limiting cell wall clearly distinct from the inner protoplasm. The protoplasm of the rickettsial cells itself shows pronounced differences in density; the denser areas may be more or less sharply localized. Rickettsial cells are pleomorphic, i. e. the cells of a given preparation differ much in size and shape.

Another category of parasitic micro-organisms whose characteristics may be considered as intermediate between bacteria and viruses is the pleuropneumonia-like group. The literature has been reviewed by

Sabin.⁴⁷ Electron micrographs of the pleomorphic cells of a pleuropneumonia-like strain from arthritis in a rat are recorded by Weiss.⁴⁸



Fig. 26.—*Clostridium tetani* cells from twenty-four hour culture. In the cells of this young culture the protoplasm is homogeneous within its clear cell walls, stages of cell division and peritrichous flagella are shown. Slightly reduced from an electron micrograph with a magnification of 9,300 diameters

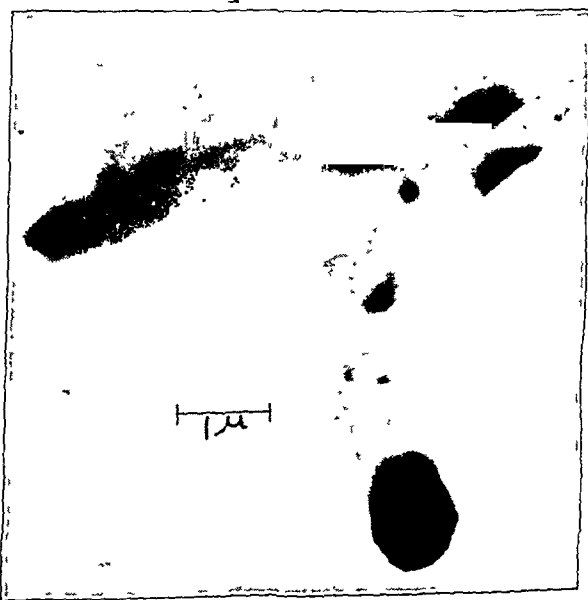


Fig. 27.—*Clostridium tetani* cells from a three day culture. Terminal "drumstick" spores formed within the bacterial cells. Slightly reduced from an electron micrograph with a magnification of 14,000 diameters

Highly pleomorphic strains of pathogenic bacteria, which exhibit growth phases resembling pleuropneumonia-like micro-organisms, are currently described by

42. Luria, S. E.; Delbrück, M., and Anderson, T. F.: *Electron Microscope Studies of Bacterial Viruses*, *J. Bact.* **46**: 57-77 (July) 1943.
43. Richards, A. G., Jr.; Steinback, H. B., and Anderson, T. F.: *Electron Microscope Studies of Squid Giant Nerve Axoplasm*, *J. Cell. & Comp. Physiol.* **21**: 129-143 (April) 1943.
44. Pinkerton, H.: *The Pathogenic Rickettsiae, with Particular Reference to Their Nature, Biologic Properties and Classification*, *Bact. Rev.* **6**: 37-78 (March) 1942.
45. Plotz, H.; Smadel, J. E.; Anderson, T. F., and Chambers, L. A.: *Morphological Structure of Rickettsiae*, *J. Exper. Med.* **77**: 355-358 (April) 1943.
46. Weiss, L. J.: *Electron Micrographs of Rickettsiae of Typhus Fever*, *J. Immunol.* **47**: 353-357 (Nov.) 1943.

47. Sabin, A. B.: *The Filtrable Micro Organisms of the Pleuropneumonia Group*, *Bact. Rev.* **5**: 1-66 (March) 1941.
48. Weiss, L. J.: *Electron Micrographs of Pleuropneumonia like Organisms*, *J. Bact.* **47**: 523-533 (June) 1944.

Dienes and Smith^{48a} and by Hesselbrock and Foshay.^{48b} Although these forms may depart widely in structure and reproductive behavior from ordinary monomorphic conceptions of bacterial morphology, their organization is still essentially cellular. A pleomorphic strain of *Bacteroides funduliformis* is under electron microscopic study.^{48c}

MORPHOLOGY OF VIRUSES

The viruses are intracellular agents of disease which can be propagated only in the presence of cells that they parasitize. The viral infectious units, moreover, are too small to be resolved and in most cases even to be made visible by ordinary light. It has been natural therefore for many to suppose that viruses are essentially similar to one another in their physical and chemical nature. Other students of viruses, however, notably T. M. Rivers,⁴⁹ have for some years advanced reasons for concluding that viruses are heterogeneous and differ widely in nature among themselves. The electron microscope is providing clear morphologic evidence of the heterogeneity of viruses. Vaccinia elementary bodies,⁵⁰ as an example of the larger viruses,

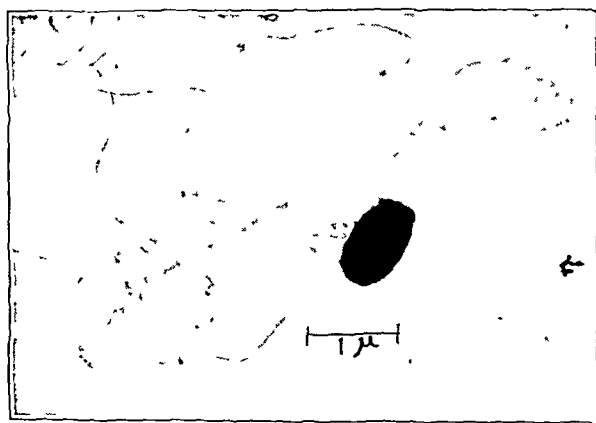


Fig 29—*Clostridium sporogenes* cells from a three day culture. Nothing remains of the vegetative cells except "ghosts," to which peritrichous flagella remain attached, in one "ghost" is a spore. Slightly reduced from an electron micrograph with a magnification of 14,000 diameters.

have an essentially cellular organization resembling that of bacteria; viruses of intermediate size such as bacteriophage still possess structural differentiation;⁴² the smallest viruses apparently are giant molecules or minute crystals. A scale of dimensions is given in figure 37.

Animal Viruses.—The morphology of that category of viruses in which the elementary infectious units are largest, namely the psittacosis-lymphogranuloma trachoma group, has not yet been investigated with the electron microscope as far as we are aware. Such studies would be most desirable.

Vaccinia Elementary Bodies.—The morphology of the virus of vaccinia has been presented in clearest detail by Green, Anderson and Smadel,⁵¹ from whom the following is quoted:

⁴⁸ Smith, W. E., and Mudd, S. To be published.
⁴⁹ Rivers, T. M. Viruses and Virus Diseases (Lane Medical Lectures), Stanford University, Calif., Stanford University Press, 1939.
⁵⁰ Rivers, T. M. Virus Diseases, with Particular Reference to Vaccinia, from Virus Diseases by Members of the Rockefeller Institute for Medical Research, Ithaca, N. Y., Cornell University Press, 1943, pp. 3-31.

(Footnotes continued in the next column)

Elementary bodies of vaccinia when viewed by electron microscopy present a high degree of regularity of external outline and of internal form. The particles are almost rectangular in shape and usually possess five circumscribed areas

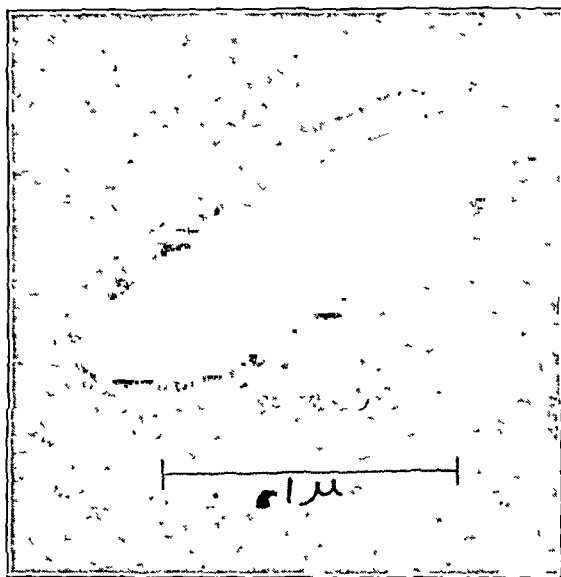


Fig 33—*Rickettsia prowazeki* from epidemic typhus. Reproduced through the courtesy of Dr. Leslie A. Chambers, Johnson Foundation for Medical Physics, University of Pennsylvania. Magnification 40,000 diameters.

which are more dense than the surrounding substance and hence appear darker in the electron micrograph. The central area of condensation in the elementary body is slightly larger than the others which are spread around it; their general arrangement suggests that of the five spots on dice.

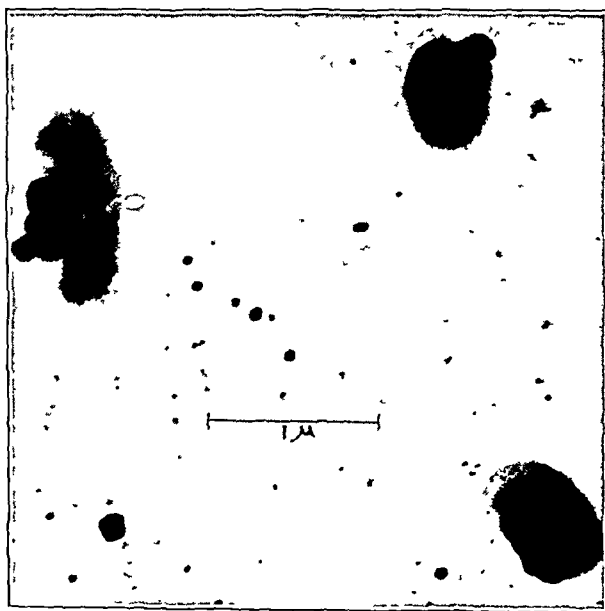


Fig 34—*Rickettsia prowazeki* from murine typhus. Reproduced through the courtesy of Dr. L. A. Chambers. Reduced from an electron micrograph with a magnification of 40,000 diameters.

Elementary bodies which are joined by a narrow bridge of material of lighter density than the bodies themselves are not infrequently encountered. The general shape of the virus particles seems to resemble a brick (fig. 36).

⁵¹ Green, R. H., Anderson, T. F., and Smadel, J. E. Morphological Structure of the Virus of Vaccinia, *J. Exper. Med.* 75: 651-656 (June) 1942.

The elementary bodies may be cytolized by ten minutes' exposure to tenth normal sodium hydroxide. The limiting membranes of the elementary bodies remain after cytolysis as "ghosts." "Certain of the ghosts formed in this manner have ruptured; some have wedge shaped gaps in their surfaces and others show substance streaming from them."

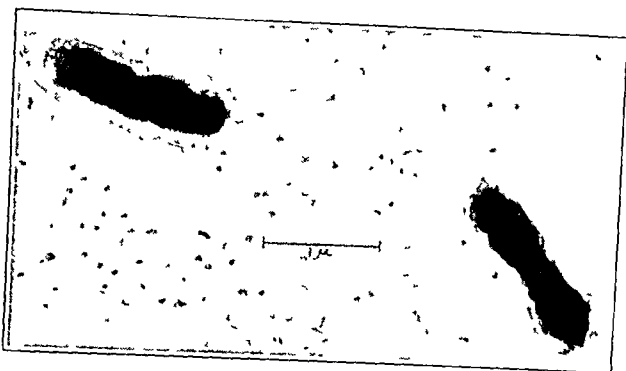


Fig 35—*Rickettsia* (*Dermacentroxenus rickettsi*) from Rocky Mountain spotted fever. Reproduced through the courtesy of Dr L. A. Chambers. Reduced from an electron micrograph with a magnification of 40,000 diameters.

Elementary bodies of vaccinia thus resemble bacteria in having an essentially cellular organization. In their complex chemical and antigenic composition⁵⁰ they also resemble bacteria.

Influenza, Equine Encephalomyelitis, Papilloma and Foot and Mouth Disease Virus Particles.—Identifica-

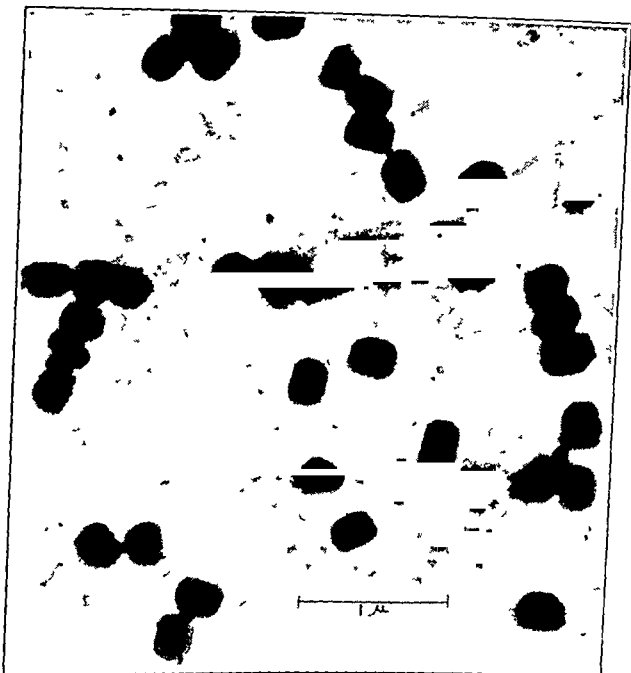


Fig 36—*Vaccinia* elementary bodies. Reproduced through the courtesy of Drs R. H. Green, T. F. Anderson and J. E. Smadel.⁵¹ The polyhedral bodies are often joined to form diploids or short chains by the continuity of their limiting surface. Reduced from an electron micrograph with a magnification of 45,000 diameters.

tion and characterization of the elementary infectious units causing virus diseases in man and animals has been rendered very difficult by the fact that until recently the sole sources of such virus particles have been suspensions prepared from infected somatic tissues. Introduction of the method of propagation of virus in

the chorioallantoic sac⁵² of the embryonated hen's egg with recovery of virus from the chorioallantoic fluid has ameliorated but not removed this difficulty of distinguishing with certainty between infectious agent, tissue detritus and other noninfectious material.⁵³

Moreover, the physical methods employed for separation of viruses, such as ultrafiltration, ultracentrifugation, electrophoresis and diffusion measurements, are complex and contain possibilities of error which may be incompletely explored. It is not surprising, then, that the morphology of very few viruses of human and other animal diseases may as yet be described without reservation.

COMPARATIVE SIZES OF VIRUSES

	Molecular weight X 10 ⁶ (Particle weight X 6.68 X 10 ¹³)	Diam or length X width in mμ
Red blood cells*	173 000 000	7 500
<i>Bacillus prodigiosus</i> *	173 000	750
<i>Rickettsia</i> *	11 100	300
<i>Psittacosis</i> *	8 500	275
<i>Vaccinia</i> *	4 300	225
<i>Myxoma</i> *	4 300	
<i>Canary pox</i> *	4 300	
<i>Pleuro-pneumonia organism</i> *	1 400	
<i>Pseudo rabies</i>	1 400	150
<i>Ectromelia</i>	1 400	
<i>Herpes simplex</i>	1 400	
<i>Rabies fixe</i> *	800	
<i>Borna disease</i>	800	125
<i>Influenza</i>	400	
<i>Vesicular stomatitis</i>	400	100
<i>Staphylococcus bacteriophage</i> †	300	
<i>Fowl plague</i>	300	90
<i>Cys bacteriophage</i>	173	
<i>Chicken tumor I</i> *	142	70
<i>Tobacco mosaic</i> *	35	
<i>Cucumber mosaics 3 and 4</i> *	35	280 X 15
<i>Gene</i> (Winters est of max size)*	33	
<i>Latent mosaic of potato</i> *	26	430 X 9.8
<i>Rabbit papilloma</i> (Shope)*	25	
<i>Equine encephalitis</i>	23	38
<i>Megatherrum bacteriophage</i> †	23	
<i>Rift valley fever</i>	11	30
<i>Tomato bushy stunt</i> *	8	
<i>Hemocyanin molecule</i> (Busycon)*	6.7	22
<i>Yellow fever</i>	4.3	
<i>Tobacco ring spot</i> *	3.4	19
<i>Louping ill</i>	2.8	
<i>Hemocyanin molecule</i> (Octopus)*	2.8	20
<i>Alfalfa mosaic</i> *	2.1	
<i>Polio myelitis</i>	0.7	12
<i>Staphylococcus bacteriophage</i> †	0.4	
<i>Foot-and-mouth disease</i>	0.4	10
<i>Hemoglobin molecule</i> (Horse)*	0.069	
<i>Egg albumin molecule</i> *	0.040	9 X 3

Fig 37—Comparative sizes of viruses, revised as of June 1944 by W. M. Stanley³ (fig 6).

Early studies of the infectious agent of influenza derived from lung tissue led to the conclusion that the diameter of the infectious unit was between 80 and 120 millimicrons. The nature of influenza virus was

⁵² Woodruff, A. M., and Goodpasture, E. W. The Susceptibility of the Chorioallantoic Membrane of Chick Embryos to Infection with the Fowl Pox Virus, *Am J Path* **7**: 209-222 (May) 1931. Scott, J. P. Swine Influenza, 13th International Veterinary Congress, Zurich Inter-laken **1**: 479-490, 1938. Henle, W., and Chambers, L. A. The Serological Activity of Extraembryonic Fluids of Chick Infected with Virus of Influenza A, *Proc Soc Exper Biol & Med* **46**: 713-717 (April) 1941. Burnet, F. M. Growth of Influenza Virus in the Allantoic Cavity of the Chick Embryo, *Australian J Exper Biol & M Sc* **19**: 291-295 (Dec) 1941. Nigg, C., Wilson, D. E., and Crowley, J. H. Studies on the Cultivation of Influenza Virus, *Am J Hyg*, Sect B **34**: 138-147 (Nov) 1941.

⁵³ A word of caution is perhaps in order with respect to virus strains propagated within the chorioallantoic sac. Burnet and Bull (Changes in Influenza Virus Associated with Adaptation to Passage in Chick Embryos, *Australian J Exper Biol & M Sc* **21**: 55-69 [June] 1943) have shown that the virus of influenza A, isolated from human cases, on propagation in ovo undergoes phase variation. The adapted or derivative (D) phase differs appreciably in a number of respects from the original (O) phase. Only the derivative phase can be propagated in the allantoic cavity.

reinvestigated by Chambers and Henle⁵⁴ and by Chambers, Henle, Lauffer and Anderson,⁵⁵ using both suspensions from influenzal lungs and suspensions of virus obtained from the allantoic fluid of chick embryos infected with influenzal virus. The results of sedimentation experiments in the angle ultracentrifuge, together with other observations, seemed to indicate the elementary infectious particles of influenza to be only about 11 millimicrons in diameter. Subsequent work, however, revealed an unreckoned complication dependent on convection currents in the angle centrifuge⁵⁶. Critical reinvestigations of the infectious units of human influenza viruses A and B by Taylor, Sharp and their collaborators,⁵⁷ by Stanley⁵⁸ and by Friedewald and Pickels⁵⁹ have recently indicated in each case that the unit infectious particles of human influenza virus have diameters within the range originally estimated. Similar findings are obtained by Taylor, Sharp, McLean, the Beards, Dingle and Feller⁶⁰ for the virus of swine influenza.

Electron micrographs recently made in the RCA laboratories in Princeton of preparations of PR 8 strain (type A) and Lee strain (type B) human influenza virus, purified and concentrated from infectious extra-embryonic fluids of chick embryos by means of differ-



Fig 38—Virus of human influenza type A, PR 8 strain. Reproduced through the courtesy of Dr Wendell M. Stanley. Reduced from an electron micrograph with a magnification of 30,000 diameters.

ential centrifugation, are shown in figures 38 and 39. These may be characterized as spheres with a diameter of about 100 millimicrons. Recent analysis by Knight^{59b} in Stanley's laboratory indicates, however, that even these infectious purified virus particles have measurable

54 Chambers, L. A., and Henle, W.: Studies on the Nature of the Virus of Influenza. I. The Dispersion of the Virus of Influenza A in Tissue Emulsions and in Extraembryonic Fluids of the Chick, *J. Exper. Med.* 77: 251-264 (March) 1943.

55 Chambers, L. A., Henle, W.; Lauffer, M. A., and Anderson, T. F.: Studies on the Nature of the Virus of Influenza. II. The Size of the Infectious Unit in Influenza A, *J. Exper. Med.* 77: 265-276 (March) 1943.

56 Friedewald, W. I., and Pickels, E. G.: Size of Infective Particle and Hemagglutinin of Influenza Virus as Determined by Centrifugal Analysis, *Proc. Soc. Exper. Biol. & Med.* 52: 261-262 (March) 1943.

57 Taylor, A. R.; Sharp, D. G.; Beard, D.; Beard, J. W.; Dingle, J. H., and Feller, A. L.: Isolation and Characterization of Influenza A Virus (PR 8 Strain), *J. Immunol.* 47: 261-282 (Sept.) 1943. Sharp, D. G., Taylor, A. R., McLean, I. W., Jr., Beard, D., Beard, J. W., Feller, A. L., and Dingle, J. H.: Isolation and Characterization of Influenza Virus B (Lee Strain), *ibid.* 48: 129-153 (Feb.) 1944. Sharp, D. G., Taylor, A. R., McLean, I. W., Jr., Beard, D., and Beard, J. W.: Density and Size of Influenza Virus A (PR 8 Strain) in Solution, *Science* 100: 151-153 (Aug. 18) 1944.

58 Stanley, W. M.: An Evaluation of Methods for the Concentration and Purification of Influenza Virus, *J. Exper. Med.* 70: 255-266 (March) 1944. Stanley, W. M.: The Size of Influenza Virus, *J. Exper. Med.* 70: 267-283 (March) 1944.

59 Friedewald, W. I., and Pickels, E. G.: Centrifugation and Ultrafiltration Studies on Allantoic Fluid Preparations of Influenza Virus, *J. Exper. Med.* 70: 301-317 (March) 1944.

59a Taylor, A. R., Sharp, D. G., McLean, I. W., Jr., Beard, D.; Beard, J. W.; Dingle, J. H., and Feller, A. E.: Purification and Character of the Swine Influenza Virus, *J. Immunol.* 48: 361-379 (June) 1944.

59b Knight, C. A.: A Sedimentable Component of Allantoic Fluid and Its Relationship to Influenza Viruses, *J. Exper. Med.* 80: 83-100 (Aug.) 1944.

amounts of normal chick components associated with them, possibly adsorbed to their surfaces.

Infectious particles have recently been separated by Taylor and his collaborators⁶⁰ from the tissue of chick embryos infected with the virus of equine encephalomyelitis (eastern strain). These particles are described by the authors as containing 54 per cent fat solvent

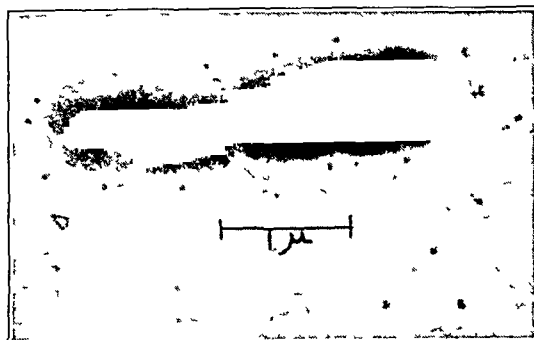


Fig 42—Bacteriophage particles, α strain, attached to cells of *Escherichia coli*. Reduced from an electron micrograph with a magnification of 17,500 diameters.

extractable material, 4 per cent carbohydrate and the remainder nucleoprotein of the ribose type. Electron micrographs show these particles to be of considerable uniformity; they are described by the authors as "probably spherical in shape, constituted peripherally of a substance the limits of which are ill defined in the micrographs in the absence of special treatment." The centers of these particles appear to be denser than the peripheries. After appropriate treatment with isotonic solution of three chlorides diluted 1:3 with 0.25 per cent calcium chloride the peripheral portion of the particles becomes darker and sharper. The authors give the mean diameter of the particles of vague outline as 40.2 millimicrons, that of the particles after treatment with calcium chloride as 47.5 millimicrons.

It may be considered that the observations summarized suggest a differentiation of these virus infec-

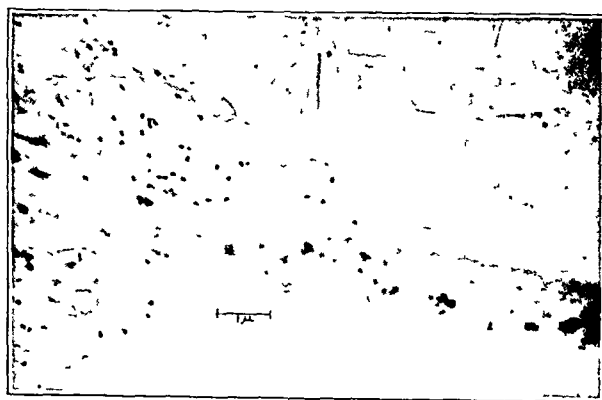


Fig 43—*Escherichia coli* plus virus γ , twenty three minutes' contact. A bacterium immediately after lysis showing protoplasmic granules and several hundred particles of virus. Reproduced from Luria, Delbrück and Anderson⁴² (fig. 5). Reduced from an electron micrograph with a magnification of 20,000 diameters.

tious units into a surface material enclosing an inner material of different composition. If all the foregoing observations are confirmed and the particles are proved

60 Taylor, A. R.; Sharp, D. G.; Beard, D., and Beard, J. W.: Isolation and Properties of the Equine Encephalomyelitis Virus (Eastern Strain), *J. Infect. Dis.* 72: 31-41 (Jan.-Feb.) 1943. Electron Micrography of the Eastern Strain Equine Encephalomyelitis Virus, *Proc. Soc. Exper. Biol. & Med.* 51: 332-334 (Dec.) 1942.

beyond question to be actual infectious units of the virus, it would appear that these and similar virus units may represent the simplest organization⁶¹ of life thus far described.

Electron micrographs of similar character have been published by the same authors⁶² for the virus of the

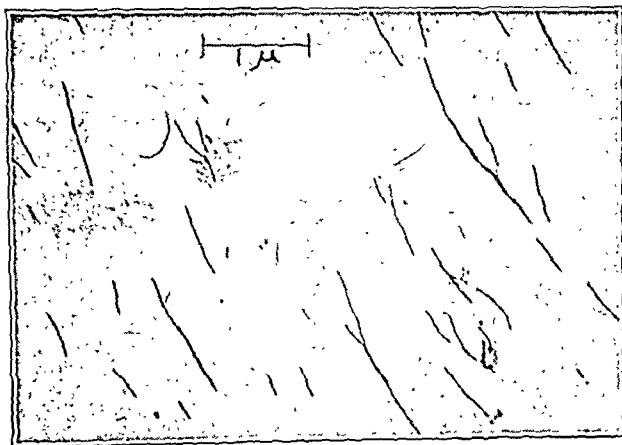


Fig. 45.—Virus of cucumber mosaic 4. Reproduced from Stanley and Anderson⁷⁵ (fig. 15). Reduced from an electron micrograph with a magnification of 20,000 diameters.

western strain of equine encephalomyelitis. The authors conclude that "the western strain equine encephalomyelitis virus is a spherical or disk shaped particle of

density surrounded by an enveloping material of less density." The same authors have reported similar findings for the virus of rabbit papillomatosis.⁶³

Glaser and Stanley⁶⁴ have separated purified nucleoprotein particles from the blood of silkworms diseased with silkworm jaundice. Electron micrographs and ultracentrifugation data show these particles to be spheres with a diameter of the order of 10 millimicrons and molecular weight of about 300,000. Preparations of these purified particles reproduce the disease in very high dilution; despite this and other suggestive evidence, the authors refrain from drawing the conclusion that these particles are to be considered with certainty as being the active disease agent.

Electron micrographs of particles believed by the authors to be the virus of foot and mouth disease have been published by von Ardenne and Pyl.⁶⁵

Bacterial Viruses.—The physical nature of bacterial viruses (bacteriophage particles) until the introduction of the electron microscope could only be inferred from

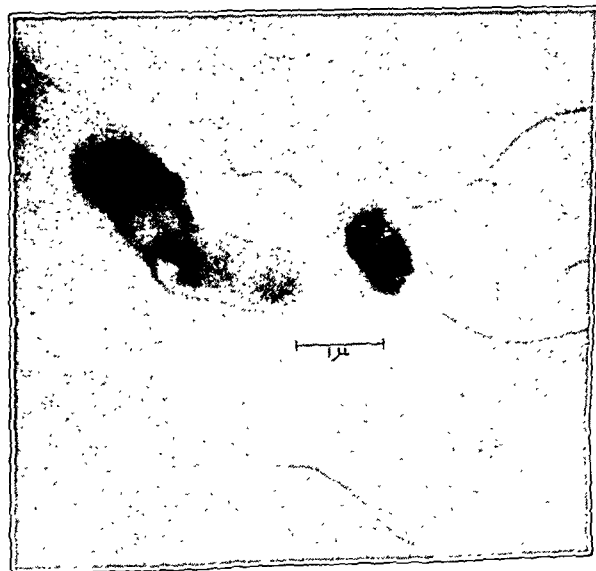


Fig. 48.—*Eberthella typhosa* sensitized with 1:8 antityphoid rabbit serum; one hundred and five seconds' contact with serum. Flagella and cell somatic surfaces are coated with protein from the specific antiserum. Reduced from an electron micrograph with a magnification of 27,000 diameters.



Fig. 47.—*Eberthella typhosa* sensitized with 1:4 antityphoid rabbit serum; thirty seconds' contact with serum. The flagella are thickened and darkened by deposition of antibody globulin on their surfaces; the bacterial cell walls also have a film of protein from the specific antiserum. Clear spaces due to shrinkage of the inner protoplasm on drying separate the protoplasmic membrane from the serum-sensitized cell walls. Reduced from an electron micrograph with a magnification of 27,000 diameters.

approximately 40 millimicrons in diameter. Electron micrographic images reveal an internal structure characterized by a round or oval region of relatively high

studies by indirect methods. Investigations prior to 1941 have been reviewed by Krueger and Scribner.⁶⁶ Investigations of bacterial viruses with the aid of the electron microscope have been published by Ruska,⁶⁷ Kausche and Pfankuch,⁶⁸ Luria and Anderson,⁶⁹ Luria, Delbrück and Anderson⁴² and by Baylor, Severens and Clark.⁷⁰

63. Sharp, D. G.; Taylor, A. R.; Beard, D., and Beard, J. W.: Study of the Papilloma Virus Protein with the Electron Microscope, *Proc. Soc. Exper. Biol. & Med.* **50**: 205-207 (June) 1942.

64. Glaser, R. W., and Stanley, W. M.: Biochemical Studies on the Virus and the Inclusion Bodies of Silkworm Jaundice, *J. Exper. Med.* **77**: 451-466 (May) 1943.

65. von Ardenne, M., and Pyl, G.: Versuche zur Abbildung des Maul- und Klauenseuche-Virus mit dem Universal-Elektronenmikroskop, *Naturwissenschaften* **28**: 531-532 (Aug. 16) 1940.

66. Krueger, A. P., and Scribner, E. Jane: The Bacteriophage, Its Nature and Its Therapeutic Use, *J. A. M. A.* **116**: 2160-2167 (May 10), 2269-2277 (May 17) 1941.

67. Ruska, H.: Die Sichtbarmachung der Bakteriophagen Lyse im Uebermikroskop, *Naturwissenschaften* **28**: 45 (Jan.) 1940.

68. Kausche, G. A., and Pfankuch, E.: Isolierung und übermikroskopische Abbildung eines Bakteriophagen, *Naturwissenschaften* **28**: 46 (Jan.) 1940.

69. Luria, S. E., and Anderson, T. F.: The Identification and Characterization of Bacteriophages with the Electron Microscope, *Proc. Nat. Acad. Sci.* **28**: 127-130 (April) 1942.

70. Baylor, M. R. B.; Severens, J. M., and Clark, G. L.: Electron Microscope Studies of the Bacteriophage of *Salmonella Pullorum*, *J. Bact.* **47**: 277-282 (March) 1944.

61. By "organization," in the sense used, is meant differentiation and localization of components of structure which are not merely structural units or "building stones" of a single molecule.

62. Sharp, D. G.; Taylor, A. R.; Beard, D., and Beard, J. W.: Electron Micrography of the Western Strain Equine Encephalomyelitis Virus, *Proc. Soc. Exper. Biol. & Med.* **51**: 206-207 (Nov.) 1942.

The definitive studies of phage structure thus far are those of Luria, Delbrück and Anderson.⁴² These concern particularly two strains of coli phage, α and γ , which are propagated on the same strain of *E. coli*; the same bacteria then produce particles of type α if acted on by virus α , and particles of type γ if acted on by virus γ . Both types of phage particle, amazingly, prove to be structurally differentiated "sperm shaped" bodies.

"The particles of virus α have a round head, 45 to 50 millimicrons in diameter and uniformly dark in the micrographs; that means uniformly scattering for 60 kilovolt electrons (fig. 40). To this round head is attached a tail about 150 millimicrons long and not more than 10 to 15 millimicrons thick. The tail appears either straight or slightly curved.

"The particles of virus γ present a very peculiar aspect (fig. 41). To an oval head, 65 by 80 millimicrons, a straight tail, 120 millimicrons long and 20 millimicrons thick, is attached at one of the narrow poles. The head always shows a structure consisting of light and dark areas. The structure, although striking enough to make the particles immediately recognizable, is quite variable. Four frequent configurations can be described schematically as X shaped, Z shaped, inverted Z shaped and diplococcus shaped."

The authors believe that the dark parts represent regions of greater thickness in the dried particle. "It is possible that the particles in the native state are oval, but on drying the more aqueous parts collapse, while the solid parts retain more scattering material, which forms the dark areas of the heads."

Particles of another coli-virus are round, 50 to 60 millimicrons in diameter, and no tail can be seen.⁴² Particles of a staphylococcus virus have a head about 100 millimicrons in diameter and a tail about 200 millimicrons long.⁴²

In later work Anderson⁴³ has demonstrated that the heads of coliphage particles may be injured by sonic vibration or by ultraviolet irradiation, so as to permit escape of the dense material of the head, leaving its surrounding membrane as a "ghost" to which the tail is still attached.

Plant Viruses.—W. M. Stanley in 1935 announced the preparation of the virus causing mosaic disease in tobacco plants in the form of a crystalline nucleoprotein. Subsequent work has confirmed and greatly extended this discovery. The unit particle of this virus is now well established to be a rod shaped nucleoprotein "macromolecule" whose diameter is about 15 millimicrons and whose length is about 280 millimicrons. These molecules tend to aggregate end to end and side to side to form crystal-like structures of two dimensional regularity (fig. 44). Analysis by x-ray diffraction⁴⁴ has shown that the unit particles or molecules of the tobacco mosaic virus nucleoprotein themselves have a definite internal architecture that is due to regular and periodic arrangement of the structural units of which the macromolecule is composed.

Minute amounts of these crystalline macromolecules properly inoculated into susceptible plants of many species are infective; the virus is capable of indefinite propagation in diseased plants; modifications of the virus have been observed to occur in certain host plants and the variant virus strains have been shown to have

demonstrable chemical differences from the parent strain.⁴⁵ Tobacco mosaic virus thus possesses the properties of reproduction and adaptation, two attributes which have heretofore been considered as distinctively characteristic of living systems; whether or not a crystalline nucleoprotein molecule can be considered to be alive, however, raises questions which cannot profitably be considered here.

Other plant viruses, such as the cucumber mosaic virus (fig. 45), have been shown to be essentially similar to that of tobacco mosaic disease. The virus of tomato bushy stunt (fig. 46),⁴⁴ on the other hand, has been shown to consist of spherical particles about 26 millimicrons in diameter and that of tobacco necrosis⁴⁵ of essentially spherical particles about 20 millimicrons in diameter.

NOTE.—The second instalment of this paper, by Dr. Mudd, will appear in next week's issue of THE JOURNAL.

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN E. SMITH, M.D., Secretary.

ISO-PAR.—A mixture of water insoluble isoparaffinic acids partially neutralized with hydroxybenzyl-dialiphatic amines. The water insoluble isoparaffinic acids are obtained by oxidation of petroleum hydrocarbons by the passage of a current of oxygen under pressure at an elevated temperature in the presence of a metallic catalyst. The water insoluble monocarboxylic and dicarboxylic acids with from 6 to 16 carbon atoms are separated and purified by fractional distillation. The hydroxybenzyl-dialiphatic amines are combined directly with the isoparaffinic acids or in a suitable solvent. The latter is then removed by distillation.

Actions and Uses.—Unguentum Iso-Par is for external use only. It should not be covered with thick tight bandaging, since irritation may result from this type of dressing. It is said to be of value in the treatment of pruritus ani and vaginae, mycotic infections of the hand and feet and eczemas of the ear and certain skin allergic manifestations. This ointment is stimulating, lowers the levels of irritability of the skin and is in varying degrees bactericidal and fungicidal.

Dosage.—It should be applied with a rubber finger stall, a small wad of absorbent cotton or gauze, or other convenient applicator, since it possesses an odor which may be objectionable if it persists on the fingers. The first applications may cause a temporary burning sensation, but this disappears later. The ointment should be applied to the affected area in the evening before retiring and again in the morning; if necessary, it may be applied more frequently. It is claimed that the majority of cases will show evidence of response within three to five days, possibly up to two weeks. If by that time relief is not obtained, some other form of treatment should be substituted.

Tests and Standards.—

Iso Par is a viscous, dark brown, oily liquid having a characteristic odor of burnt petroleum. It is immiscible with water; freely miscible with alcohol, volatile oil and fixed oil. The specific gravity is from 0.970 to 0.980 at 25°C.

Place about 2 cc. of iso-par in a glass stoppered cylinder, add 20 cc. of water, shake the contents for five minutes, filter through moistened paper and divide into two portions; to one portion add two drops of methyl red test solution; a distinct red color persists; to the other portion add two drops of thymol blue test solution; a distinct yellow color persists.

MEDICAL CHEMICALS

Unguentum Iso-Par: 14 Gm., 28.5 Gm., 114 Gm. and 454 Gm. jars. Contains Iso-Par 17 per cent and titanium dioxide 4 per cent in an ointment base consisting of beeswax, cetyl alcohol, lanolin and petrolatum.

71. Anderson, T. F.: The Effect of Sonic Vibration, Ultraviolet Light and Pu on the Bacteriophage Virus. Report to 1st Annual Meeting of Electron Microscope Society of America, New York, Jan. 14, 1944.

72. Bernal, J. D., and Fankuchen, I.: X-Ray and Crystallographic Studies of Plant Virus Preparations, J. Gen. Physiol. 25: 111-165 (Sept.) 1941.

73. Stanley, W. M.: Chemical Structure and the Mutation of Viruses, in Virus Diseases, Ithaca, N. Y. Cornell University Press, 1943.

74. Stanley, W. M., and Anderson, T. F.: Electron Micrographs of Protein Molecules, J. Biol. Chem. 146: 25-30 (Nov.) 1942; footnote 75.

75. Stanley, W. M., and Anderson, T. F.: A Study of Purified Viruses with the Electron Microscope, J. Biol. Chem. 139: 325-335 (May) 1941.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO 10, ILL.

Cable Address - - - "Medic, Chicago"

Subscription price - - - : Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, OCTOBER 28, 1944

PUNISHMENT FOR VENEREAL DISEASE IN THE ARMED FORCES ENDED BY CONGRESS

The signature of the President has now enacted into law S. 1250, an act to repeal section 2 of the act approved May 17, 1926, which provides for the forfeiture of pay of persons in the military and naval service of the United States who are absent from duty on account of the direct effects of venereal disease due to misconduct, and to amend Veteran's Regulation No. 10, as amended to define line of duty and misconduct for pension and compensation purposes. S. 1250 was passed unanimously by the Senate on July 3, 1943 and by the House of Representatives on Sept. 11, 1944.

The new law abolishes all punishment for the acquisition of venereal disease, which is now "in line of duty" and is not "due to wilful misconduct," provided only that the infected person complies with Army or Navy regulations requiring him to report and receive appropriate treatment, and provided further that at the time of infection he was neither avoiding duty by desertion or absence without leave, nor confined under sentence of court martial or civil court. Failure to report a venereal infection (i. e., concealment) remains punishable by court martial or other disciplinary action at the discretion of the commanding officer (A-R 40-210, par. 23e). Moreover, the new law provides that, with the exceptions noted, veterans who have acquired venereal disease in line of duty are eligible for pension and compensation benefits if disability results.

The law is not retroactive, and a claim heretofore disallowed by reason of misconduct or line of duty requirement may not be revived; but benefits may be payable on the basis of a new claim filed hereafter in such form as may be prescribed by the Administrator of Veteran's Affairs.

The abolition of punishment for venereal disease was strongly urged by the Surgeon General, U. S. Army, by the Subcommittee on Venereal Diseases, National

Research Council, and by other authorities in social hygiene and preventive medicine. Modern public health opinion is convinced that fear of punishment does not prevent exposure to venereal disease and that punitive measures promote concealment, self treatment and treatment by nonmilitary personnel. Concealment, in turn, results in continued spread of disease in the civilian population and in the armed forces themselves, and in special military hazards, as in aviators. Punishment is discriminatory, in that military personnel may be penalized not for the fact of infection but for failure to respond to treatment and for various other extraneous reasons.

Under the new law just passed, the soldier or sailor infected with a venereal disease is now on the same status as one with any other acute infectious disease. The armed forces of the United States join those of Canada and France in the abolition of punishment for illness. A public health step of the first importance has been taken.

CHRONIC GASTRITIS

In his address as retiring president of the Connecticut State Medical Society, Smith¹ discusses research on experimental gastric cancer, its background and progress. One of the stumbling blocks in the studies of human gastric cancer is chronic gastritis.

Schindler² holds that gastroscopy has brought convincing proof of the frequency and significance of chronic gastritis, which he divides into superficial, atrophic and hypertrophic varieties. He also reports that the histology of chronic gastritis has been established by a method of taking biopsies from the gastric wall without ligatures or clamps. "If a normal mucosa is found gastroscopically, a normal microscopic picture is usually seen also."

Schindler's remarkable work with the flexible gastroscope receives complete and enthusiastic endorsement by Crohn,³ who characterizes "antral gastritis" as a clinical and morphologic entity, a conclusion with which Schindler does not agree. "Gastric function in all types of gastritis is so irregular and equivocal that it cannot be the basis of classification." In gastric cancer there is frequently a long story of gastric distress; Schindler refers to modern statistics as proving that patients with chronic gastritis are three times more prone to gastric carcinoma than healthy persons.

This view, as well as current interpretations of chronic gastritis, is not supported by the morphologic

1. Smith, G. M.: Comment on Experimental Gastric Cancer, Connecticut State M. J., 8: 409 (July) 1944.

2. Schindler, R.: Gastritis in Diseases of the Digestive System (edited by Sidney A. Portis), ed. 2, Philadelphia, Lea & Febiger, 1944, p. 157.

3. Crohn, B. B.: Newer Advances in Our Knowledge of Gastritis, J. Mount Sinai Hosp. 9: 75 (July-Aug.) 1944.

studies of the mucous membrane of the stomach at various ages by Guiss and Stewart.⁴ With regard to the literature on the endoscopic aspects of chronic gastritis they say "As yet we have been unable to discover a fully correlated pathologic study made on gastroscopically diagnosed cases, nor have we had the opportunity to study enough such cases to enable us to draw any conclusions ourselves as to whether the gastroscopic diagnosis can be substantiated pathologically with uniformity."

According to Guiss and Stewart, chronic atrophic gastritis is characterized morphologically by atrophy of the mucous membrane, by increase in lymphoid tissue and in interstitial infiltration, by the transformation of the epithelial lining into the so-called intestinal or simplified type, by pyloric gland heterotopia and by increase in connective tissue. Such changes were found commonly after the fortieth year in 66 per cent of cases of death from extragastric cancer, in 82 per cent of apparently normal stomachs and in 97 per cent of deaths from gastric cancer. The inference drawn from these extensive morphologic observations is that the frequency of chronic gastritis with advancing age really may not have any other relationship to gastric cancer than intensification of gastritis by the cancer. Does early carcinoma of the stomach occur without gastritic changes?

Needed advancement in the understanding of the causation and significance of the morphologic processes of chronic gastritis will depend largely on organized cooperation by investigators concerned with the various phases of the problem. On the clinician, the gastroscopist, the radiologist and the pathologist falls the difficult task of securing adequate human material for cooperative study.

TOXICITY OF RANCID LARD

Physiologists have long recognized that rancid fats are nutritionally deleterious. According to Burr and Barnes¹ of the University of Minnesota the apparent toxic effects of rancid products are due mainly to an induced vitamin deficiency. Mixed with other foods, rancid fats destroy such essential food elements as vitamin A, carotene, vitamin D, vitamin E, pantothenic acid, pyridoxine, biotin, ascorbic acid and linoleic acid. An extreme instance of the vitamin deficiency induced by rancid fat has been reported by Fitzhugh and his associates² of the Food and Drug Administration, Washington, D. C.

Certain unexplainable abnormalities developed in control rats maintained for long periods on their routine

laboratory diets. Fitzhugh placed 20 pairs of albino rats, 21 days of age and equally divided between the sexes, on mixed diets consisting of 18 parts of casein, 60 parts of corn starch, 5 parts of brewers' yeast, 5 parts of whole dried liver, 4 parts of salt mixture, 2 parts of cod liver oil and either 6 parts of corn oil or 6 parts of lard which had been previously stored for several months at 35 F. The two dietary mixtures were prepared in sufficient quantities to last approximately six weeks and the mixtures stored in covered tin buckets at 35 F. The rancidity of the lard was established by organoleptic tests and the peroxide number determined. This was usually 41 millimols per kilogram as contrasted with 2 millimols per kilogram in fresh lard from the same batch.

During the rapid growth period of the first three months only a slight difference was apparent in the growth rates of the rats on the corn oil and rancid fat diets. Symptoms were noted in the rancid lard group after the animals had been on this diet for about a year. Control animals on the corn oil mixture were not affected. By the end of a year the rats fed the rancid lard were emaciated; with a typical humped back and roughened coat and a rapidly progressive weakness and paralysis, usually beginning in the hind legs. The emaciation, deformity and paralysis became extreme before death.

The characteristic necropsy findings were widespread focal degenerations of the skeletal muscles. Individual muscle fibers showed varying degrees of vacuolation with gray or tan pigmentation. An occasional pigmented microphage was noted within the muscle fibers. There was also a general visceral atrophy, particularly in the uterus. This was usually small and deeply pigmented. In the male testicular atrophy occurred. Since these results are similar to the "nutritional myodegeneration" described by previous investigators³ as characteristic of lethal vitamin E deficiency, Fitzhugh concluded that under his test conditions the main toxic effect of rancid lard was due to a complete destruction of vitamin E in his stored food mixtures. Confirming this conclusion, he found that nonrancid samples of the same batch of lard were nontoxic and nutritionally equivalent to the corn oil used in his control feedings. This is in agreement with data previously reported from the U. S. Department of Agriculture.⁴

As a practical application of these results the Washington investigators emphasize that dietary mixtures should be prepared as frequently as possible and if storage is necessary it should be at a subfreezing temperature. They found that the development of rancidity is more rapid in food mixtures than in unmixed lard and that little or no rancidity develops at 20 F.

4. Guiss, L. W., and Stewart, F. W.: Chronic Atrophic Gastritis and Cancer of the Stomach, *Arch. Surg.* **46**: 823 (June) 1943.

1. Burr, G. O., and Barnes, R. H.: *Physiol. Rev.* **23**: 256, 1943.

2. Fitzhugh, O. G.; Nelson, A. A., and Calvery, H. O.: *Proc. Soc. Exper. Biol. & Med.* **56**: 129 (June) 1944.

3. Mason, K. E.: *Yale J. Biol. & Med.* **14**: 605, 1942. Pappenheimer, A. M.: *Physiol. Rev.* **23**: 37, 1943.

4. Hoagland, R., and Snider, G. G.: *Tech. Bull.* 821, U. S. Dept. Agr., 1942.

Current Comment

CHICAGO VENEREAL DISEASE CONTROL PROGRAM

A program of venereal disease control in Chicago was begun in January 1937 by the Chicago Board of Health in cooperation with the United States Public Health Service, the Federal Works Agency and the Illinois Department of Public Health. The annual report¹ for 1942-1943, has now been published. The organization of the project centers in an office of venereal control, under which are six principal subdivisions dealing respectively with clinics, the Chicago Intensive Treatment Center, education, investigation, registry and statistics, including reporting and records. The program is staffed by a venereal disease control officer, who is a surgeon in the U. S. Public Health Service, two reserve public health officers and six other division heads. The objectives of the program, as stated at its inception Jan. 2, 1937, are (a) to uncover all possible cases of venereal disease, (b) to place each newly discovered case under competent medical care, (c) to keep infectious cases under treatment until they are no longer a menace to society or to themselves and (d) to prevent new infections by all possible means, including medical, educational and legal measures. The clinic section, oldest unit of the program, is designated as the diagnostic keystone of the entire project. More than 15,000 new cases of venereal disease were diagnosed through the year. Extensive case finding and case holding methods placed and kept large numbers of spreaders of venereal disease in the Chicago Intensive Treatment Center. The educational campaign enlisted tavern owners, and those signifying their willingness to cooperate were given certificates. A Central Register was maintained of all cases of venereal disease reported to the Chicago Health Department. A register is also kept of all physicians reporting such cases. The Central Register Section received an average of 10,000 items of information per month, of which approximately 38 per cent were laboratory reports of positive serologic reactions, 27 per cent morbidity reports and 29 per cent activity reports and case dispositions, the remainder being miscellaneous items. In the Clinic Section a central clinic and eight branch clinics were operated. Over 8,600 new cases of syphilis and 8,100 cases of gonorrhea, plus 514 new cases of other venereal diseases were treated in the Clinic Section. This represented a reduction of 16 per cent in syphilis cases under treatment as compared with the end of the previous year. A social service unit operated in connection with the clinic section and was reorganized during the year to form a follow-up service. The Chicago Intensive Treatment Center, formerly the Wesley Memorial Hospital, admitted its first patients on Oct. 29, 1942. Patients stayed an average of 10.9 days in this center; 2,189 patients were admitted during the year. The report also includes extensive tabulations of venereal disease reports in the city of Chicago and an analysis of control activities.

1. Progress Report Chicago Venereal Disease Control Program 1942-1943. Board of Health, Chicago 10.

THE RELATIONSHIP OF FLUORESCENT PORPHYRINS TO CANCER

Figge and his co-workers¹ found that in a large number of vertebrates the harderian or accessory lacrimal glands excrete porphyrins, giving a red fluorescence only in the animals most susceptible to experimental cancer, namely mice, rats and hamsters. They also found that in strains of mice highly susceptible to breast cancer the harderian glands were more fluorescent than in strains of low susceptibility. These observations suggested the hypothesis that "there is a direct or indirect relationship between porphyrin metabolism and the factors that determine cancer susceptibility." Naturally, the question arose whether porphyrins accumulate in places where human cancer frequently occurs, as, for instance, in the female genital tract. Jones and his associates² identified porphyrins spectroscopically in red fluorescent material in various parts of the tract in about one third of the cases examined, but the occurrence of such material was not related to any definite diseases. Probably these porphyrins originate mostly from decomposition of blood. The articles cited do not claim that porphyrins are directly carcinogenic, but a good basis has been developed for further and promising studies on their relationship to carcinogenesis and other processes.

MOTIVATIONS FOR TREASON

In a lecture given before the British Psychological Society on July 1, Major A. M. Meerloo¹ of the Netherlands, a psychiatrist, whose views are presumably based on personal experience during the German occupation of his country, asks why we are so deeply affected by the idea of treachery. The traitor, he says, will not admit his treachery, but, in his own mind, his conduct is justifiable. The traitors whom he saw in his own practice were not "wicked" but were weak characters: they had been disappointed in life, they were frustrated and had transferred their feelings to political phantoms. Some were affected by serious psychiatric abnormalities; some had homosexual tendencies and had been unable to find any real basis for living. Two who took a violent part in the betrayal of Holland had a strong mother fixation, which was projected on their country. Meerloo believes these people had a grievance and desired revenge on society for real or fancied ill treatment. The desire for revenge, he points out, is the outward impulse of an inner incapacity or weakness. It is the religion of the dissatisfied and the frustrated. For the psychologist, Meerloo states, the traitor is one who needs to break away from his environment or to do violence to it and his reasons for doing so are connected with his development, particularly during adolescence.

1. Figge, F. H. J.; Strong, L. C.; Strong, L. C., Jr., and Shalhoub, A.: Fluorescent Porphyrins in Harderian Glands and Susceptibility to Spontaneous Mammary Cancer in Mice, *Cancer Research* 2:335 (May) 1942. Figge, F. H. J.: Fluorescence Studies on Cancer, *ibid.* 4:465 (Aug.) 1944.

2. Jones, E. G.; Figge, F. H. J., and Hundley, J. Mason, Jr.: The Red Fluorescence of the Genitalia of Women, *Cancer Research* 4:472 (Aug.) 1944. Figge, F. H. J.; Jones, E. G., and Wolfe, G. F.: The Extraction and Identification of Porphyrins from the Red-Fluorescent Exudates on the Genitalia of Women, *ibid.* p. 483.

1. Meerloo, A. M.: A Study of Treason, *Lancet* 2:321 (Sept. 2) 1944.

MEDICINE AND THE WAR

ARMY

TWENTIETH GENERAL HOSPITAL UNIT WINS HIGH PRAISE

Admiral Lord Louis Mountbatten, supreme allied commander in southeast Asia, recently presented a plaque to the 20th General Hospital, U. S. Army, in appreciation of treatment he received while suffering from an injury to his eye. Admiral Mountbatten became a patient at the army hospital after his left eyeball was cut by a branch which struck him while he was driving through the jungle on the Ledo front in Burma. During his week at the hospital in Assam Province, India, he was treated by Major Harold G. Scheie, who is credited with saving the sight of the injured eye. The plaque presented to the hospital unit has on its face a decorative design encircled by a border on which are the words "Supreme Allied Commander South East Asia." On the reverse of the plaque are the words "Presented to the 20th General Hospital, U. S. A. (Staffed by Volunteers from the University of Pennsylvania Under the Command of Colonel I. S. Ravdin), by Admiral the Lord Louis Mountbatten, G.C.V.O., C.B., D.S.O., A.D.C., Supreme Allied Commander of the Allied Forces in the South-East Asia Theatre, in Grateful Appreciation of the



Lord Mountbatten's gift: drawing of a plaque presented by the grateful British commander to the members of the 20th General Hospital, U. S. Army, who helped save his eye after a jungle accident.

Excellent Treatment He Received During the Week He Spent in the Hospital from an Injury to His Left Eye on the Ledo Front in Burma."

Appreciation of the treatment he received was also expressed by Lord Mountbatten in a letter to Colonel Ravdin, commanding officer of the hospital unit, who is on leave of absence from the Harrison professorship of surgery and the directorship of the Harrison Department of Surgical Research while serving with the army. Lord Mountbatten wrote "I am writing to thank you personally, and through you all members of the 20th U. S. General Hospital staff concerned, for the way I was looked after during my week in the hospital 7th to 14th March 1944 after receiving an injured eye. Throughout my stay I was treated with unbounded kindness and untiring attention. You can certainly be proud of the wonderful team that the University of Pennsylvania has committed to your care. If anything could increase my affection and regard for our American allies, my week with you would undoubtedly do so."

In addition, the unit has also received a captured Japanese battle flag autographed by Brig. Gen. F. D. Merrill and bears the notation "For 20th Gen. Hospital from 5307 with our thanks. Captured from Jap 18 Division near Kamaing, Burma, April 1944." In a letter to the commanding officer of the hospital

unit, General Merrill paid the following tribute to the unit: "On leaving this area for another assignment I wish to express to you and all members of your staff my very sincere appreciation of the efficient medical and surgical service which you have given. I understand fully that we have added a great amount of work to an already overworked staff, but it has always been comforting to know that when my sick and wounded reached your hospital they were assured of the very best medical and surgical treatment available in this theater."

The hospital unit also received letters of commendation from Major Gen. W. E. R. Covell and Brig. Gen. Lewis A. Pick in the China-Burma-India theater.

The 20th General Hospital Unit, organized by the University of Pennsylvania, was called into active service in May 1942. It includes physicians, surgeons, dentists, nurses, technicians, Red Cross workers and enlisted personnel. The unit has been in India since early last year and is the largest American army hospital in the China-Burma-India theater.

MALARIA CONTROL IN PACIFIC PROVES SUCCESSFUL

Brig. Gen. R. W. Bliss, Assistant Surgeon General of the Army, and Brig. Gen. F. W. Rankin, director of the Surgical Consultant Division, Office of the Surgeon General, who recently returned from an inspection tour of the Pacific area, state that the malaria control activities of the Army's Medical Corps have resulted in cleaning up the South Pacific of mosquito infestation. They visited Honolulu, Maui, Canton, Mandi (Fiji Islands), Tantonio, Noumea, Espiritu Santo, Guadalcanal, Russell Island, Tarawa, Makin, Kwajalein, Saipan, Tinian and Guam. Both officers were favorably impressed with the success of the malaria control work on all these islands.

General Bliss reported on the use of a new deodorant, PDB, which has supplanted the use of crude oil to kill flies and maggots in latrines. Where 5 gallons of oil daily had been used with only limited success, half a pound of PDB powder is now sprinkled twice a week for effective deodorization. Besides the added effectiveness of the deodorant, it saves much valuable transportation, space and manpower.

AMBULANCE PRESENTED TO ARMY MEDICAL DEPARTMENT

An army ambulance was recently donated to the Medical Department of the Army by the Thomasville, N. C., Society of the National Society, Children of the American Revolution. Lieut. Col. Mason Ladd, director of the legal division of the Office of the Surgeon General, accepted the gift on behalf of the War Department.

CAPTAIN WOODROW L. PICKHARDT A PRISONER OF WAR

Capt. Woodrow L. Pickhardt, formerly of Lawton, Okla., who was reported missing in action June 7, has recently been reported to be a prisoner of war of the German government. Dr. Pickhardt is a graduate of the University of Oklahoma School of Medicine, Oklahoma City, in 1937. He entered the service Aug. 11, 1942.

TREATMENT OF GONORRHEA

In the Technical Bulletin of Medicine, No. 96, recently issued by the War Department, penicillin is stated to be the drug of choice in the treatment of gonorrhea. The use of sulfonamides will be limited to cases not responding to adequate penicillin therapy and instances in which penicillin is not available through normal supply channels.

NAME GENERAL HOSPITAL FOR DENTAL CORPS OFFICER

The War Department recently announced the naming of the Rodriguez General Hospital at San Juan, Puerto Rico, in honor of the memory of Major Fernando E. Rodriguez, U. S. Army Dental Corps. Major Rodriguez, who died in 1932, was one of dentistry's foremost research scientists, pioneering in the study of the bacteriologic aspects of dental diseases. The results of his work were so fundamental that it has been used as the basis for all further scientific research along this line. He developed new techniques and methods of analysis and made many other contributions to the science of bacteriology. Major Rodriguez received a B.S. degree from Georgetown University, Washington, D. C., in 1924, after having served in the Army since 1917. He was a member of the District of Columbia Dental Society, a member of the International Association of Dental Research and a fellow of the American College of Dentists.

ARMY AWARDS AND COMMENDATIONS

Captain H. Myles Johnson

Capt. H. Myles Johnson, formerly of Fort Supply, Okla., and now attached to the famous Seagrave Hospital Unit headed by Lieut. Col. Gordon S. Seagrave, recently received a special citation from Brig. W. L. Boatner. The Seagrave Hospital Unit is with General Stilwell's forces, who are clearing northern Burma so that American engineers can extend the Ledo road to the Burma road. Dr. Johnson is credited with helping to save the lives of 2,000 Chinese soldiers on the battlefields. He has been in China, Burma, India theater of war for more than two years. Soon after the Myitkyina Airfield was captured by American and Chinese troops, the Seagrave Unit moved in. The citation reads "During this period he was under constant enemy fire, making his way over the most difficult of jungle terrain and, with utter disregard for personal safety, administered to the medical needs of both Chinese and American patients. The splendid performance of duty and disregard for personal safety reflects credit on his organization and the esprit de corps of the United States Army." Dr. Johnson graduated from the University of Oklahoma School of Medicine, Oklahoma City, in 1934 and entered the service Sept. 15, 1941.

Major George L. Thorpe

Major George L. Thorpe, formerly of Valley Center, Kan., and now a flight surgeon of a Liberator bomber group operating from an advanced air base in Italy, has been awarded the Soldier's Medal. He was decorated for the courage he displayed last February in rescuing an injured navigator from a burning plane that crashed near its home base. Unmindful of the intense heat and exploding ammunition, Dr. Thorpe rushed into the wreckage, hacking his way through burning debris to rescue a fellow officer, whom he succeeded in carrying out from what would have been a funeral pyre. Seconds later the burning ship exploded with a terrific impact, but the doctor and his charge were already safe. Dr. Thorpe graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1938 and entered the service Aug. 13, 1942.

Major Carl D. Makart

Major Carl D. Makart was recently awarded the Silver Star for gallantry in action. As soon as enemy bombs had set fire to an ammunition dump at Humboldt Bay, Dutch New Guinea, Dr. Makart, a regimental surgeon in the medical corps of the Fighting Forty-First Infantry Division, established an aid station near the scene and worked throughout the night until the following afternoon taking care of the casualties. While performing his duties Dr. Makart was in constant danger of being hit himself by shrapnel from flying bombs. Formerly of Chicago, Dr. Makart graduated from Creighton University School of Medicine, Omaha, in 1938. He was commissioned into the service Sept. 9, 1941 and was promoted to captain on Feb. 28, 1942 and to rank of major on Jan. 24, 1943.

Colonel Otis O. Benson Jr.

The Legion of Merit was awarded by the War Department to Col. Otis O. Benson Jr., formerly of Tower, Minn. The citation accompanying the award read "In his capacity as chief of Aero Medical Research at Wright Field from Sept. 6, 1940 to July 15, 1943 he was responsible for successfully developing, testing and standardizing all items of medical equipment used in connection with military aviation. His professional skill and organizing ability made it possible for his unit, during a period of rapidly changing requirements, to succeed in applying previously known principles of aviation medicine to the practical situations of modern warfare and solving new problems arising from unexpected developments in aerial combat." Dr. Benson graduated from Rush Medical College, Chicago, in 1930 and entered the service July 31, 1931.

Captain Amos V. Persing Jr.

The Bronze Star was recently awarded to Capt. Amos V. Persing Jr., formerly of Watsonstown, Pa., for heroic achievement in action during the period Nov. 21, 1943 to Jan. 9, 1944 in Italy. He led his battalion medical section often under enemy artillery fire in treatment of wounded personnel. During a ten day period 500 rounds of artillery shells burst within the battalion area. This action took place at Cassino. Dr. Persing on this and other occasions in which casualties were heavy calmly and with great efficiency carried on his treatment of the wounded. Dr. Persing's action under fire reflects great credit on himself and the military service. Dr. Persing graduated from the University of Cincinnati College of Medicine in 1929 and entered the service Aug. 13 1942.

Captain Louis J. Feves

The Soldier's Medal was recently awarded to Capt. Louis J. Feves, formerly of Pendleton, Ore. The citation accompanying the award reads "for heroism displayed in the Gilbert Islands on Jan. 21, 1944. With complete disregard for his own safety he aided in the rescue of injured and recovery of deceased crew members of an airplane that had crashed on a heavily mined reef. This act of heroism reflected great credit on himself and the military service." Dr. Feves graduated from the University of Oregon Medical School, Portland, in 1935 and entered the service July 9, 1942.

Colonel Frederick J. Frese

Col. Frederick J. Frese, formerly of Yonkers, N. Y., was recently awarded the Legion of Merit for "exceptionally meritorious conduct in the performance of outstanding services in the South Pacific Area from Sept. 27, 1942 to June 1, 1944." Dr. Frese graduated from St. Louis University School of Medicine in 1938 and entered the service on completion of his internship in 1939.

Captain George H. Lage

A Presidential Citation has been issued to the parachute infantry unit to which Capt. George H. Lage, formerly of Portland, Ore., was attached as surgeon, for their work in spearheading the invasion of France and the taking of Carentan. Dr. Lage graduated from the University of Oregon Medical School, Portland, in 1939 and entered the service Sept. 22, 1942.

Captain Edward J. Doherty

Capt. Edward J. Doherty, formerly of Woodhaven, N. Y., was recently awarded the Silver Star and the Purple Heart for a leg wound which he sustained at Cherbourg. Dr. Doherty graduated from New York Medical College, Flower and Fifth Avenue Hospitals, New York, in 1934. He entered the service Aug. 7, 1942 and was sent to England in February 1944.

Colonel Walter S. Jensen

Col. Walter S. Jensen was recently awarded the Legion of Merit for "exceptionally meritorious conduct in the performance of outstanding services from July 31, 1941 until Oct. 5, 1942." Dr. Jensen graduated from the College of Medical Evangelists, Loma Linda, Calif., in 1924, and entered the service Oct. 22, 1925.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

Oct. 23 1944.

Federal-State Program of Vocational Rehabilitation

Details of the expanded vocational rehabilitation program under the Federal Security Agency, recently initiated by Congress in amendments to the Vocational Rehabilitation Act (Public Law 113, 78th Congress) were outlined for THE JOURNAL today. They provide for federal aid to enable state boards of vocational education and state agencies for the blind to furnish disabled persons with all services necessary to render them employable or more advantageously employable. These services include medical and surgical care, hospitalization, physical and occupational therapy, prosthetic appliances, vocational counseling and training, maintenance during training, occupational tools and equipment, placement in employment and other necessary services.

Mentally as well as physically disabled persons are now eligible for rehabilitation. Except for certain groups of war disabled civilians and federal employees injured in line of duty, persons receiving physical restoration services or maintenance grants must be in financial need. (It was emphasized that rehabilitation of veterans with service connected disabilities is conducted through the separate program under the U. S. Veterans Administration.)

The Federal Office of Vocational Rehabilitation is responsible for establishing standards in the various areas of services, for technical assistance to the states and for certification of funds on the approval of state plans for vocational rehabilitation meeting the requirements of the authorizing act of Congress. On request, the Surgeon General of the U. S. Public Health Service has assigned Senior Surgeon (R) Dean A. Clark as chief medical officer and three other medical officers to assist in the organization of the physical restoration activities. A national professional advisory committee composed of representatives of fields of medicine actively concerned with rehabilitation, hospital administration, public health nursing, medical social work, physical therapy and occupational therapy has been appointed by the federal security administrator to assist the Office of Vocational Rehabilitation in the technical phases of physical restoration service.

State agencies have been advised of policies to be followed in organizing the physical restoration phases, and similar professional advisory committees are being appointed by all state rehabilitation agencies to guide them in establishing and maintaining professional standards for physical restoration.

Medical diagnosis and treatment of disabled persons under care of state rehabilitation agencies is limited to physicians licensed to practice medicine and surgery and otherwise qualified by training and experience to perform the specific services required. Criteria for the designation of medical specialists may include certification by the appropriate American medical specialty boards, fulfillment of the training and experience requirements for admission to examination by such boards, state agency standards for the qualification of physicians in particular specialties or approval of individual specialists by the state professional advisory committee. Rates of remuneration for physicians, nurses, dentists, physical therapists and other medical personnel for services in physical restoration are being established by state agencies in consultation with their professional advisory committees and will be similar to rates paid for similar work under state supervision, such as crippled children or workmen's compensation, or under federal supervision, such as that of the Veterans Administration or the U. S. Employees Compensation Commission. State rehabilitation agencies must purchase hospital care at inclusive rates. In approving state standards for hospital facilities the Office of Vocational Rehabilitation will for the present be guided by the list of hospitals approved by the American College of Surgeons. Preference will be given to hospitals having more than 100 beds with well developed specialty services, medical social service, physical

therapy and occupational therapy, in view of special requirements. Eligible to receive the service are any person in the United States, District of Columbia, Puerto Rico and Hawaii who has a disability that is (1) a substantial employment handicap, (2) static or (3) remediable to a substantial extent in a reasonable time. Said a spokesman "Vocational rehabilitation is designed to conserve the working usefulness of the civilian disabled. In restoring a disabled person to productive work he is being transferred from the public assistance rolls to the payrolls of industry, by which he resumes his status as a self-supporting member of the community."

Medical Economic Abstracts

Progress of Medical Service Plans

To form a basis for mutual comparison, the various medical society prepayment plans were asked by the Bureau of Medical Economics for as recent a financial report as it was possible to give. Some of the principal items of the reports received are given here. Copies of these reports in full are available for administrators of all existing and proposed plans.

Surgical Care, Inc.—This was organized late in 1942 to serve Jackson County, Mo., and Wyandotte County, Kan. Its contracts covered surgery, obstetrics, anesthesia and x-ray. On Jan. 31, 1944 it had a membership of 3,525 males and 5,144 females, including subscribers and dependents. Its income from subscribers up to Jan. 31, 1944 was \$23,448, of which it expended \$18,323.96 and now has a surplus of \$5,124.04.

Medical Expense Fund of New York, Inc.—According to recent advices (THE JOURNAL, May 27, p. 296) the Medical Society of the State of New York has unanimously endorsed the merger of the Community Medical Care, Inc., a medical insurance affiliate of the Associated Hospital Service, which has 43,000 subscribers, and the Medical Expense Fund of New York, Inc., with 1,200 subscribers. The new group will be known as United Medical Services.

Medical Service Association of Pennsylvania.—This was organized in June 1940 and serves the state of Pennsylvania. It offers only surgical contracts, and as of Dec. 31, 1943 it had 3,086 subscribers and 5,631 dependents, making a total of 8,717 entitled to service. Its income to the date given was \$45,722.02 and expenditures \$45,796.57, showing a loss of \$74.55 on operation. It had on hand a reserve of \$25,631.72.

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics, St. Louis, Nov. 9-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.
- American Society for the Hard of Hearing, New York, Nov. 10-12. Mr. Raymond H. Greenman, 1537 Thirty-Fifth St., N.W., Washington 7, D. C., Managing Director.
- Annual Conference of State Secretaries and Editors, Chicago, Nov. 17-18. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.
- Association of Military Surgeons of the United States, New York, Nov. 2-4. Col. James M. Phalen, Army Medical Museum, Washington 25, D. C., Secretary.
- Central Neuropsychiatric Association, Chicago, October 31. Dr. Ernest M. Hammes, 1124 Lowry Medical Arts Bldg., St. Paul 2, Minn., President.
- Central Society for Clinical Research, Chicago, Nov. 3-4. Dr. Carl V. Moore, 602 S. Euclid Ave., St. Louis 10, Secretary.
- Midwestern Section of American Federation for Clinical Research, Chicago, Nov. 2. Dr. Richard H. Lyons, University Hospital, Ann Arbor, Mich., Secretary.
- New York State Association of Public Health Laboratories, Albany, Nov. 17. Miss Mary B. Kirkbride, New Scotland Ave., Albany 1, Secretary.
- Puerto Rico, Medical Association of, Santurce, Dec. 15-17. Dr. E. Martinez-Rivera, P. O. Box 3866, Santurce, Secretary.
- Southern Medical Association, St. Louis, Mo., Nov. 13-16. Mr. C. P. Loranz, Empire Building, Birmingham 3, Ala., Secretary.
- Western Surgical Association, Chicago, Dec. 1-2. Dr. Arthur R. Metz, 250 East Superior St., Chicago, Secretary.

Pittsburgh

Special Society Elections.—Dr. John D. Sturgeon Jr., Uniontown, is president of the Pittsburgh Pediatric Society, Dr. Joseph S. Baird vice president and Dr. Christian J. Stoecklein secretary-treasurer.—Dr. Kenneth E. Appel, Philadelphia, was chosen president-elect of the Pennsylvania Psychiatric Society at its sixth annual dinner meeting at the University Club, September 21, and Dr. George W. Smeltz was installed as president. Dr. LeRoy M. A. Maeder, Philadelphia, is secretary and Dr. Ralph L. Hill, Wernersville, the immediate past president. Speakers at the meeting included Comdr. James M. Henninger (MC) on "Navy Psychiatry, with Particular Reference to the South Pacific" and Lieut. Col. Baldwin L. Keyes, M. C., "Psychiatry in the Middle East."

TENNESSEE

Dr. Diggs Goes to Cleveland-Clinic.—Dr. Lemuel W. Diggs, since 1938 associate professor of medicine at the University of Tennessee College of Medicine, Memphis, has accepted an appointment as clinical pathologist in charge of the clinical laboratories of the Cleveland Clinic, Cleveland, effective January 1. Dr. Diggs graduated at Johns Hopkins University School of Medicine, Baltimore, in 1926 and was for three years a member of the department of medicine at the University of Rochester School of Medicine and Dentistry, Rochester, N. Y. He has been directing his attention to sickle cell anemia.

GENERAL

Anesthesia Session Planned.—Investigators wishing to present material for clinical research before the Eastern section of the American Federation for Clinical Research at a meeting in Boston, December 9, are urged to communicate with Dr. Orville T. Bailey, Harvard Medical School, 25 Shattuck Street, Boston, before November 15. An abstract of not over two hundred words should be submitted.

Louis Dublin Serves as Temporary Head of Red Cross.—Louis I. Dublin, Ph.D., New York, second vice president and statistician of the Metropolitan Life Insurance Company, on October 2 became temporary executive officer of the American Red Cross and will serve in this capacity until the return of Basil O'Connor, who is now on an inspection tour of Red Cross operations in France and Great Britain. Dr. Dublin is on loan to the Red Cross for a limited period. His normal assignment is as assistant to Mr. O'Connor, acting as coordinator of the various operating divisions of the Red Cross. In his new appointment Dr. Dublin will devote full time to Red Cross activities.

Annual Forum on Allergy.—The seventh annual Forum on Allergy will be held in the Hotel William Penn, Pittsburgh, January 20-21. A feature of the meeting will be the first award of the Marcelle Prize, established by the Marcelle Cosmetics, Inc., Chicago, in 1944 to be awarded to the author of the best paper on allergy appearing in the American medical literature during the year. The first prize will be for \$350 and the second for \$150. Physicians attending the session will have access to twelve study groups in addition to special lectures, motion pictures, demonstrations, symposiums and panel discussions. On Friday evening preceding the forum the American Association of Allergists for Mycological Investigation will hold its annual meeting, at which time the results of its cooperative research on allergy to fungi will be reviewed.

Meeting of Anesthetists.—The American Society of Anesthetists will meet in the Rice Hotel, Houston, November 2, and at the University of Texas Medical Branch, Galveston, November 3, as guests of the Texas Association of Medical Anesthetists. In addition to clinical demonstrations and round table discussions the following will speak:

Dr. Robert L. Sanders, Memphis, Tenn., Surgeon-Anesthetist Relationship.
Dr. Hubert R. Hathaway, San Francisco, The Postoperative Ambulatory Patient.
Lieut. Col. William J. Winter, M. C., and Comdr. Jarvis C. Youngblood (MC), War Anesthesia.
Dr. Ralph M. Waters, Madison, Wis., Imperfections of Inhalation Anesthesia.

At the dinner meeting Thursday evening speakers will include Dr. Ernst W. Bertner, Houston, on "Anesthesia in the Development of Surgery" and Chauncey D. Leake, Ph.D., Galveston, "The Centennial of Anesthesia."

Award in Mental Hygiene Created.—The Albert and Mary Lasker Foundation, Inc., has established the Lasker Award of \$1,000 to be given annually through the National Committee for Mental Hygiene for outstanding service in the

field of mental hygiene. The new award will be conferred at the annual meeting of the committee in the autumn of each year. The purpose of the award is to recognize significant contributions to promoting mental hygiene and to making the broad field and program of mental hygiene more familiar to the general public. Each year the award will be made for a contribution in some special aspect of the field of mental hygiene which seems to be of most immediate and current significance. The recipient of the award will be selected by an anonymous jury chosen annually for its competence to judge accomplishment in a particular field. The award this year will be for mental hygiene work related to the war. The recipient will be chosen from among leaders who have done work in the general enhancement of the mental health of the men and women of the services, both while in service and during the period of rehabilitation, so far as developed at the time. The work must either have been completed or have been tested and won general acceptance within the year preceding the granting of the award. Recipients will not necessarily be limited to persons in the United States. If some outstanding contribution has been made abroad in a particular field, the award will be made jointly with the leading mental hygiene organization of that foreign country.

Industrial Hygiene Foundation.—The ninth annual meeting of the Industrial Hygiene Foundation of America will be held at the Mellon Institute, Pittsburgh, November 15-16. The theme of the meeting will be "Postwar Industrial Health." Among the speakers will be:

Dr. Hallowell Davis, Boston, Protection of Workers Against Noise.
Dr. Leonard E. Himler, Ann Arbor, Mich., Practical Psychiatry in Industry.
George R. Hill, Ph.D., Salt Lake City, Effectiveness of Tall Stacks in Minimizing Air Pollution from Industrial Plants.
Lieut. Col. Theodore F. Hatch, S. C., Upper Limits of Tolerance to Heat and Humidity.
Francis R. Holden, Ph.D., and W. C. L. Hemen, M. S., Pittsburgh, Findings from Foundation Surveys of War Plants.
Dr. George W. Wright, Saranac Lake, N. Y., Medical Aspects of Compensation for Partial Disability from Silicosis.
Theodore C. Waters, Baltimore, Legal Aspects of Compensation for Partial Disability from Silicosis.
Marshall Dawson, Washington, D. C., Second Injury Funds as Employment Aids to the Handicapped.
Vandiver Brown, New York, Legal Developments in 1944 Respecting Industrial Health.
Andrew Court, Detroit, The Economic Basis of Health.
William M. Gafar, D.Sc., Washington, D. C., Sickness Indemnification.
Nathan Sinai, D.P.H., Ann Arbor, Mich., Medical Expense Indemnification.
Dr. Carl M. Peterson, Secretary, Council on Industrial Health, American Medical Association, Chicago, Recent Developments in Pre-placement Physical Examinations.
V. P. Ahearn, executive secretary, National Industrial Sand Association, Increasing Importance of Industrial Health in Industrial Relations.

One session on "Putting the Disabled Veteran Back to Work" will be presided over by Dr. Clarence D. Selby, medical consultant, General Motors Corporation, Detroit.

Academy of Pediatrics.—The American Academy of Pediatrics has designated its meeting at the Hotel Jefferson, St. Louis, November 9-11, as a "Wartime Conference on Child Health." One session will be devoted to the control of rheumatic fever with the following speakers: Drs. Alexander T. Martin, New York; Rene Wegria, New York; Alexis F. Hartmann, St. Louis; Ann G. Kuttner, Irvington, N. Y.; T. Duckett Jones and Benedict F. Massell, Boston; Col. Leonard G. Rowntree, M. C.; John George Fred Hiss, Syracuse; George M. Wheatley, New York; Betty Huse, Washington, D. C.; Paul F. Dwan, Minneapolis; Louise F. Galvin, Richmond, Va., and Clark H. Hall, Oklahoma City. Other speakers on the program will include:

Dr. Madge T. Macklin, London, Ont., Erythroblastosis Fetalis.
Dr. Gerardo Varela, Jacuba, Mexico, Bacterial Dysenteries.
Drs. Grover F. Powers and Paul L. Boisvert, New Haven, Conn., Age as a Factor in Streptococcoses.
Dr. Wallace E. Herrell, Rochester, Minn., Penicillin, Its Use in Pediatrics.
Dr. Leslie Nelles Silverthorne, Toronto, Whooping Cough.
Dr. Hattie E. Alexander, New York, Treatment of H. Influenzae Infections in Children.
Dr. John A. Toomey, Cleveland, The Neuropathies.
Ernest Carroll Faust, Ph.D., New Orleans, Arthropod Borne Diseases.

A special feature of the meeting will be a symposium on parenteral therapy conducted by Dr. Hartmann and Drs. Allen M. Butler, Boston; Luther Emmett Holt Jr., Baltimore, and Sam Z. Levine, New York.

College of Surgeons Expands Graduate Training Program.—The American College of Surgeons announces the appointment of Major Gen. Charles R. Reynolds, M. C., retired, former surgeon general of the U. S. Army, as consultant in graduate training in surgery and of Dr. George H. Miller, dean and professor and head of the department of medicine, American University of Beirut, Beirut, Lebanon, as

director of educational activities. The appointments are part of an expanded program of graduate training in surgery of the college. Both physicians will have offices at the Chicago headquarters of the college. The department of graduate training in surgery is under the direction of Dr. Malcolm T. MacEachern, Chicago, chairman of the administrative board of the college. It will be responsible to the committee on graduate training in surgery and to the board of regents. In addition to General Reynolds and Dr. Miller, the staff of the department will consist of Dr. Paul S. Ferguson, director of surveys, three assistants who conduct the surveys, and the field representatives conducting the regular hospital standardization surveys under the direction of Dr. Earl W. Williamson, assistant director of the college, who aid as required in the graduate training program. The latter is a development of the basic work of the college in stimulating the improvement of hospital service. General Reynolds is leaving his position as director of the Pennsylvania state bureau of tuberculosis control, Harrisburg, Pa., where he has been serving for the past four years, to accept the new appointment. He was commandant of the Army Field Service Medical School, Carlisle Barracks, Pa., from September 1923 to 1931 and surgeon general of the Army for a four year term beginning 1935.

Western Surgical Association.—The fifty-second annual meeting of the Western Surgical Association will be held at the Drake Hotel, Chicago, December 1-2. At the annual dinner Friday evening the president of the association, Dr. Willis D. Gatch, Indianapolis, will speak on the "Prospects of Our Association." Other speakers will be Dr. Herman L. Kretschmer, President, American Medical Association, Chicago, and Capt. E. Eric Larson (MC) on "The Medical Aspects of Our War in the Pacific." Among other speakers on the program will be:

- Dr. Francis E. Clough, San Bernardino, Calif., Madura Foot.
Dr. Neil J. MacLean, Winnipeg, Man., The Technic for Closure of the Ring of Postoperative Abdominal Hernia.
Dr. Jacob K. Berman, Indianapolis, Intercapulothoracic Disarticulation of the Arm.
Drs. Erwin R. Schmidt, Ralph M. Waters and Noel A. Gillespie, M., Use of Thiouracil in the Treatment of . . .
Dr., San Jose City, Thyroidectomy by the Off the Trachea Method.
Dr. Herbert H. Davis, Omaha, Amino Acids Used Intravenously in Surgical Patients.
Drs. Earl C. Padgett, Kansas City, Mo., and John H. Gaskins, Use of Skin Flaps in the Repair of Scarred or Ulcerative Defects over Bone and Tendons.
Dr. Louis P. Good, Texarkana, Texas, Origin and Growth of an Adenoma of the Islands of Langerhans.
Drs. Stanley R. Maxeiner and Col. Harry E. Bundy, M. C., Resection of Pancreas for Hyperinsulinism.
Drs. Warren H. Cole and John T. Reynolds, Chicago, Resection of the Duodenum and Head of the Pancreas for Carcinoma.
Dr. Thomas G. Orr, Kansas City, Pancreaticoduodenectomy for Carcinoma of the Ampulla.
Dr. J. Dewey Bisdorf, Omaha, Gastric Resection for Certain Acute Perforated Lesions of the Stomach and Duodenum with Diffuse Sclerosing of the Peritoneal Cavity.
Dr. Stuart W. Harrington, Rochester, Minn., Surgical Treatment of Pharyngo (Esophageal) Diverticulum (Review of 140 Cases).
Dr. Robert L. Sanders, Memphis, Tenn., Review of One Hundred Subtotal Gastrectomies for Benign Ulcer.
Dr. Henry K. Ransom, Ann Arbor, Mich., Gastrojejunocolic Fistula.
Drs. Claude F. Dixon and Raymond E. Benson, Rochester, Surgical Management of Sigmoidal Carcinoma Involving the Urinary Bladder.
Dr. Owen H. Wangersten, Minneapolis, Preservation of the Sphincters and Intestinal Continuity in Operation for Carcinoma of the Rectal Ampulla.
Drs. Charles G. Johnston and Elisha S. Gurdjian, Detroit, Peripheral Nerve Injury in Association with Fractures of Long Bones.
Drs. Loyal Davis, George E. Perret and Walter W. Carroll, Chicago, Repair of Peripheral Nerves in the Presence of Extensive Soft Tissue and Bone Injuries of the Extremities.
Dr. Henry W. Meyerding, Rochester, Chronic Sclerosing Osteitis: Differential Diagnosis.
Dr. Kellogg Speed, Chicago, Treatment of Infected Pin Operations for Fractures of the Neck of the Femur.
Dr. Melvin S. Henderson, Rochester, Status of the Bone Graft in Ununited Fractures of the Neck of the Femur.
Dr. Glen Evan Cheley, Denver, Personal Evaluation of Vitallium Cup Arthroplasty of the Hip Joint.

Southern Medical Association.—The thirty-eighth annual meeting of the Southern Medical Association will be held at the Municipal Auditorium and the Jefferson Hotel, St. Louis, November 13-16, under the presidency of Dr. James A. Ryan, Covington, Ky., who assumed the position on the death, May 2, of Dr. William T. Wootton, Hot Springs National Park, Ark. The first general public session has been designated President's Night, at which Dr. Ryan will discuss "The Public's Obligation to the Medical Profession." Other speakers will include Dr. Herman L. Kretschmer, President, American Medical Association, Chicago, on "The Progress of Medicine During the Past Fifty Years," and Major Albert J. Stowe, G. S. C., "Be Vigilant and Mum!" A feature of this meeting will be the presentation of the Leslie Dana Gold Medal by the St. Louis Society for the Blind to Miss Linda Neville,

Lexington, Ky. (THE JOURNAL, July 8, p. 730). A second public session Wednesday evening will be devoted to "Medicine in the War," at which the speakers will be Capt. Alphonse McMahon (MC), on "Civilian Tropical Disease Problems Following Demobilization"; Col. Howard A. Rusk, M. C., "New Horizons in Medicine," and Rear Admiral Luther Sheldon Jr. (MC), "Navy Medicine in the War." Among the many speakers on the program, which is further divided into general clinical and sectional sessions, are:

- Dr. William C. MacDonald, St. Louis, Thiouracil in the Management of Hyperthyroidism.
Drs. Vincent de P. J. Derbes, Hugo T. Engelhardt and Theodore A. Watters, New Orleans, Management of Migraines.
Dr. George T. Harrell Jr., Dr. William L. Venning Jr. and William A. Wolff, Ph.D., Winston-Salem, N. C., Treatment of Rocky Mountain Spotted Fever.
Dr. John T. Howard, Baltimore, Experiences with the Gastroscope over a Period of Six Years.
Dr. Charles F. Mohr, Baltimore, Results of Penicillin Treatment in Neurosyphilis.
Capt. Arthur C. Allen, M. C., and Dr. Sophie Spitz, M. C., Pathology of Scrub Typhus (Tsutsugamushi Fever).
Drs. Walter S. Lawrence and Walter W. Robinson, Memphis, Radio-sensitive Parasellar Tumors: Case Reports.
Dr. Harry S. Bernton, Washington, D. C., Castor Bean Sensitiveness: Case Report.
Capt. Frederick A. Jostes (MC), Physical Medicine: Its Importance in Any Rehabilitation Program.
Col. John C. Burch, M. C., and Lieut. Col. Herbert C. Fisher, M. C., Appendicitis Mortality.
Dr. Robert A. Knight, Memphis, Treatment of Fractures of the Tibial Condyles.
Capt. Laman A. Gray, M. C., Treatment of Gonorrhea in the Female with Penicillin.
Dr. James A. Seaman, Springfield, Mass., Endocervicitis as a Factor in Urologic Infections.
Dr. Victor K. Allen, Tulsa, Okla., Perirectal Fistula as a Port of Entrance for Torula Encephalitis.
Dr. Murdock S. Elyen, Atlanta, Ga., Magnetic Removal of Foreign Bodies from the Food and Air Passages Under Fluoroscopic Guidance.
Dr. Stuart C. Cullen, Iowa City, Use of Curare in Anesthesia.

Other features of the session will be a symposium on the essentials of medical education participated in by:

- Dr. Edwin P. Lehman, Charlottesville, Cultural Values in Medical Education.
Dr. Jacques P. Gray, Richmond, Va., Undergraduate Curriculum in Medicine.
Dr. Hiram W. Kostmayer, New Orleans, Medical Education Above the Undergraduate Level.
Dr. Cornelius O. Bailey, Los Angeles, Postwar Medical Education.
Dr. Victor Johnson, Secretary, Council on Medical Education and Hospitals, American Medical Association, Chicago, Postgraduate Training After the War.
Miss Marion A. Murphy, librarian, Washington University School of Medicine Library, St. Louis, The Effects of the War on the Medical School Library.

During the meeting of the Southern Medical Association other groups holding sessions will be the southern branch of the American Public Health Association, the National Malaria Society, American Society of Tropical Medicine, American Academy of Tropical Medicine and the southern chapter of the American College of Chest Physicians. The thirtieth annual meeting and dinner for women physicians of the Southern Medical Association will be held November 15.

FOREIGN

Personal.—Dr. Alan N. Drury, director of the Lister Institute, London, has been named honorary secretary of the advisory board to the Beit Memorial Trustees, the group sponsoring the memorial fellowships for medical research.

Academy of Medical Sciences in Russia.—An Academy of Medical Sciences of the Union of Soviet Socialist Republics has been organized, the *British Medical Journal* reports. It is to be set up under the People's Commissar for Health and will have three departments: medical biology, hygiene, microbiology and epidemiology, and clinical medicine.

Deaths in Other Countries

Israel J. Kligler, Ph.D., formerly an associate of the Rockefeller Institute for Medical Research, died in Jerusalem, September 23. Dr. Kligler, who had held the Jacob Epstein chair of bacteriology and hygiene at Hebrew University since 1926, came to Palestine in 1943 as head of the malaria research unit sent by Hadassah the Zionist women's organization. Dr. Kligler, who was born in Austria in 1889, received his doctor of philosophy degree at Columbia University in 1915.

CORRECTION

Therapeutic Effect of Para-Aminobenzoic Acid in Louse Borne Typhus Fever.—In the paper by Yeonians et al. in THE JOURNAL, October 7, the authors request that the following correction be made in table 6 on page 354: The average age of the B group should be changed from 18 to 27.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 30, 1944.

Chair of Child Health Established in London

With Lord Nuffield's approval the trustees of the Nuffield Foundation have allocated \$50,000 a year for ten years to provide a chair of child health in the University of London, an offer which has been gratefully accepted by the trustees of the university. This grant will enable a postgraduate institute of child health to be created for teaching and research on all aspects of child health. It is proposed that the institute shall be associated with the principal children's hospital in this country—the Hospital for Sick Children, Great Ormond Street, London, and with the obstetric department of the British Postgraduate Medical School at the Hammersmith Hospital. Lord Nuffield and the trustees of his foundation believe that the promotion of child health must have a prominent place in the organization of the future health services of the country. They appreciate that the development of research and training in this sphere requires new and enlarged facilities. They desire that the exceptional resources of the University of London for postgraduate education and research may be developed in a manner which will make the new Institute of Child Health worthy of the capital city of the empire.

The provision of academic centers for the teaching of child health has already been undertaken in several provincial universities, and the Nuffield Provincial Hospitals Trust has within the last three years made a substantial contribution to the University of Durham to assist in creating a chair of child health at King's College, Newcastle-on-Tyne. Edinburgh has had such a chair since 1931, and another has just been established at Liverpool by collaboration of the university with the city council. The title of the new chair is noteworthy. This country has never been backward in the study of pediatrics; on the contrary, it has made great advances in that subject. But "Hospital" or "Department for Diseases of Children" has always been the designation for the institution concerned. Now the idea has become popular that the medical profession has been too preoccupied with the treatment of disease, and that prevention, or the preservation of health, should have a more prominent place as an objective. Calling the government's projected scheme a "National Health Service" instead of a "National Medical Service" is a case in point.

The Doctor's View of the Proposed National Health Service

Under the caption "The Doctor's View," Lord Dawson, president of the British Medical Association, reviews the government's proposals for a national health service in a letter to the *Times*. The medical profession, he says, has realized that the growth of medical knowledge was outstripping the organization of medical practice and for nearly twenty-five years has put forward plans to improve the availability of its services. There is little dispute over objectives, then, but there are differences about methods. The profession insists on a substantial share in the planning and administration of the proposed service at every level, Lord Dawson states. The service should be guided by those persons, both medical and lay, who have expert knowledge. Do local authorities know anything about medicine? he asks. How can they plan and administer, unaided, hospital services? In the war we use expert guidance. Why attempt to do otherwise with medicine, which becomes more complex year by year?

We accept the proposal that this nationwide service, which spends public money, must be under theegis of a minister responsible to parliament, Lord Dawson says, but we claim also that, for the service to be efficient, the medical profession must have a responsible share in its planning and administration. To effect this at the center would be relatively easy if the two sides were like minded, but local administration has inherent difficulties, because its present shape and the proposed service would be misfits, it is claimed. Since the reconstruction of local government will be impossible amid pressing postwar problems and it is undesirable to delay laying the foundations of the service, it is acknowledged that we must seek a provisional, "make do" administration, provided skilled guidance is secured and provided the voluntary hospitals are ensured equality of opportunity and private practice is given full freedom. These requirements would be met if medical and other skilled persons were made partners with the elected representatives of the people on the local bodies. The profession seeks to share in, not to dominate, the work of planning and execution.

Experience has shown that advisory committees standing outside the executive body are futile, the letter continues. The inadequacy of local bodies, as now constituted, to administer highly technical services is well known. But extraneous forces obstruct satisfactory settlement. One political school desires to seize this opportunity for furthering its ideology, which would mean whole time employment for medical men as part of the civil service, paid by salary. The impact of this influence, in the face of the government's repeated assurance that it has no such intentions, undermines confidence, Lord Dawson points out. Regarding the voluntary hospitals, suggestions are being made to transfer the administration of all hospitals to a central board. These suggestions are unfortunate. It is most important to take advantage of the knowledge, interest and local patriotism of each area and put responsibility on it. Central control would take the heart out of local government and lead to inanimate uniformity. The smooth running of a coordinated hospital service for each area under university influence is the foundation of any comprehensive service, the president's letter concludes.

The Dalton Centenary

John Dalton, who founded modern chemistry by putting the atomic theory on a quantitative basis, worked in Manchester, where he taught mathematics and physics. He contemplated entering the medical profession, but the expense was too great. He had a defect of color vision, now known as "daltonism," which he turned to account by producing his theory on the subject. The centenary of his death has fallen this year. It is therefore fitting that a Manchester physician, Dr. E. M. Brockbank, who has made Dalton's life a study, has published a book entitled "John Dalton—Some Unpublished Letters of Personal and Scientific Interest with Additional Information about his Colour Vision and Atomic Theories." When the 1929 meeting of the British Medical Association was held at Manchester Dr. Brockbank, president of the Section of the History of Medicine, gave an address on "John Dalton—Experimental Physiologist and Would-Be Physician." He had access to Dalton's letters and other relics and has made a thorough study of the subject.

Research at Oxford and Cambridge by Chinese

Five Chinese professors have arrived in Britain and will be the guests of certain colleges of Oxford and Cambridge. Chang Tsu-King, professor of the history of science at the Central China University, will reside in Christ's College, Cambridge, to study that subject. Yin Hung-Chang, professor of plant biochemistry at the Associated Southwestern Universities (Tsing Hua), Kunning, will do research at St. John's College, Cam-

bridge. Fan Tsen-Chung, head of the foreign languages department at the National Central University, Shapingpa, will do research in English literature, with special reference to English knowledge of China, and reside at Balliol College, Oxford. Chang-Hui-Wen, head of the department of public administration and political science at the Central University of China, will study public administration at Corpus Christi College, Cambridge. R. C. Fang, head of the foreign languages department, Wuhan University, Kiating, will do research in English literature at Trinity College, Cambridge.

BUENOS AIRES

(From Our Regular Correspondent)

Sept. 15, 1944.

Quinine and Malaria

Quinine is available in Argentina in scanty amounts. It is sold to the public only for malaria therapy and when public health authorities approve its use for other purposes. The government recently appointed a committee, as a branch of the National Department of Public Health, for studying the possibilities of obtaining quinine substitutes. A fund of \$15,000 was awarded for the studies. Drs. Carlos A. Alvarado, head of the National Antimalarial Department, Prudencio Santillan, secretary of the department, Cecilio Romano, head of the Instituto de Medicina Regional of the University of Tucumán, and Horacio Descole, head of the Lillo Institute of Tucumán, are the main members of the committee. The preliminary essays gave promising results. Further botanic and pharmacologic researches are progressing.

The government recently awarded \$150,000 to the national department for expenses incurred in the antimalarial crusade in the central and northern regions of the country. Regulations for free distribution of antimalarial drugs and plans for the crusade were submitted to the government by Dr. Carlos A. Alvarado, head of the National Antimalarial Department, and were approved. A batch of 400 larvogenic fishes was recently sent to the National Antimalarial Department by the Rockefeller Institute.

Beta Vulgaris and Pollinosis

Drs. L. Herraiz-Ballester and J. V. Monticelli recently lectured before the Argentine Society of Biology. They said that the coastal variety of *Beta vulgaris* grows abundantly near Bahía Blanca in Buenos Aires. The plant produces large amounts of pollen between October and December up to the end of the second week of December. Its pollen is the most frequent causal agent of pollinosis in the region, as shown by the results of skin tests, which were done on 150 patients with pollinosis. The pollinosis section of Bahía Blanca is heavily loaded with the pollen of *Beta vulgaris*, which fulfils Thömen's postulates. Pollinization of this chenopodiacea herb precedes or accompanies pollinization of gramineous plants. The fact is of importance, they said, especially in connection with therapy of the disease.

Brief Items

Pamphlets for education of the public on poliomyelitis are being distributed to the public by the government of Buenos Aires. The measures for preventing the disease are explained.

A celebration was held recently at the Faculty of Medicine of La Plata, which recently reached its twenty-fifth anniversary.

Drs. Armando Marotta and Nicanor Palacios Costa were recently appointed president and numeric member of the Academia Nacional de Medicina of Argentina. The library of the academy was officially opened on this occasion. It has more than 40,000 volumes.

Dr. Carlota Pereira de Queiroz of Rio de Janeiro recently delivered a lecture at the National Academy of Medicine of Buenos Aires. She spoke on the applications of hematologic examination to social medicine.

BELGIUM

(From Our Previous Correspondent)

Sept. 21, 1944.

Gratitude of the Belgians

The people of Belgium deeply appreciate the liberation of our country by the Allies. They have shown their patriotic enthusiasm for the cause of liberation and their admiration for your army. We, the Belgian physicians, wish to express also our deep gratitude to your country and our admiration for your army. We are now able to see for ourselves on our reconquered soil the amazing organization of war surgery that has been built up by the Allies at the front. Because of our experience with the hospitals during the war of 1914-1918 we can appreciate the progress achieved in the care of the wounded, and we propose to learn from contact with your medical officers the advances in war surgery that have given such good results in this war.

I wish to write a few words regarding our experiences during the occupation: The practice of all Belgian physicians was regulated by a dictatorial order which had many arbitrary rules (for authorization to practice, location of physicians and similar matters). Fortunately these regulations were received generally with inertia, and 90 per cent of physicians continued practicing without openly protesting against the regulations, suffering vexation, to be sure, but practically ignoring their existence.

As for the Belgian medical press, two journals continued to be published, one in Flemish and one in French. Some of the material of medical journals which were suppressed by the invaders was provisionally published by the International Office of Medico-Military publications in the *Archives médicales Belges* from May 10, 1940. We never could obtain any medical literature except from Germany. All papers were suppressed by the invaders. The literature that we received consisted of medical items from Swiss journals sent to us in envelopes as if they were letters.

The nightmare is over now. The medical profession and the rest of the country are ready to resume their normal place in the world.

Marriages

ROBERT PAYNE BECKWITH JR., Roanoke Rapids, N. C., to Lieut. Nancy Margaret Kimbrough of Romney, W. Va., August 8.

WILLIAM FRANCIS KIELY, Birmingham, Ala., to Miss Margaret Helene McMenamin at San Francisco, September 25.

ARNOLD W. BROCKMOLE, Evansville, Ind., to Miss Martha Frances Jakubiak of St. Louis in Cleveland, September 9.

EUGENE LEONARD WATKINS, Worcester, Mass., to Miss Victoria Pauline Peake of Brooklyn, September 23.

EDWARD MORSE SHEPARD to Miss Elizabeth Wendell Yates, both of New York in Nantucket, Mass., September 5.

HUBERT J. THOMAS, Dallas, Texas, to Miss Joella Henderson of Burkett in Wichita Falls, July 12.

GEORGE F. MCAULIFFE, North Vernon, Ind., to Miss Sally C. Edelen of Bardstown, Ky., April 15.

LAURENCE BRUGGERS, St. Anne, Ill., to Miss Edith Lois Fuller of Amesbury, Mass., July 31.

IRVING E. BENVENISTE, Los Angeles, to Miss Angela Gower Cole of Minot, N. D., August 6.

GEORGE PLATT PILLING IV, Philadelphia, to Miss Barbara Bosworth of Denver, October 2.

FREDERICK YATES to Mrs. Lou E. Cunningham, both of Washington, D. C., September 9.

EUGENE B. BRODY, Columbia, Mo., to Miss Marian Hohen of Evanston, Ill., recently.

RODNEY CHARLES TURNER, Norfolk, Va., to Miss Mary Anna Ayers, September 3.

LAWRENCE LIMBERT, Norristown, Pa., to Miss Lois Fisher of Harrisburg, July 5.

Deaths

Charles St. John Butler * Medical Director, Rear Admiral, U S Navy, retired, Bristol, Tenn., University of Virginia Department of Medicine, Charlottesville, 1897; entered the medical corps of the U S Navy as a lieutenant (jg) in 1900, advanced through the various grades to that of rear admiral in 1935, retired on April 1, 1939, instructor in bacteriology and tropical medicine intermittently at the U S Naval Medical School from 1907 to 1921 and commanding officer from 1921 to 1924 and from 1927 to 1932, formerly professor of tropical medicine at George Washington University School of Medicine, Washington, D. C., and Hahnemann Medical College and Hospital, Philadelphia, commanding officer, U S Naval Hospital, Brooklyn, from 1932 to 1935, director general of public health of the republic of Haiti from 1924 to 1927, commanding officer of the U S Naval Medical Supply Depot in Brooklyn, 1935-1936 and the U S Naval Medical Center in Washington from 1936 to 1938, detached March 31, 1939 as president of the naval retiring board and board of medical examiners and naval retiring board for officers of the medical corps, specialist certified by the American Board of Internal Medicine, served as a member of the medical board of the National Research Council, the Subcommittee on Medical Research, the National Malaria Committee, the National Advisory Health Council, the scientific board of the Gorgas Memorial Institute of Tropical and Preventive Medicine, the American Association for the Advancement of Science, the Washington Academy of Sciences, the American Association of the History of Medicine, the American Society of Clinical Pathologists and the Association of Military Surgeons of the United States, member and past president of the American Academy of Tropical Medicine, New York Society of Tropical Medicine, American Society of Tropical Medicine, the Washington branch of the Society of American Bacteriologists and the Helminthological Society of Washington, honorary member of the Society of Medicine, Haiti, fellow of the American College of Surgeons, American College of Physicians and the New York Academy of Medicine, decorated with the medal of honor and merit of Haiti, received a letter of commendation from the U S Navy Department for service in World War I, awarded the LL.D. degree by the Emory and Henry College in 1932, author of "Syphilis Sive Morbus Humanus", died October 7, aged 69, of cerebral hemorrhage.

Edward Shearman McSweeney * New York, Bellevue Hospital Medical College, New York, 1898, member of the American Association for Thoracic Surgery, American Association of Industrial Physicians and Surgeons, American Trudeau Society and the National Tuberculosis Association, fellow of the American College of Physicians, specialist certified by the American Board of Internal Medicine, formerly demonstrator of anatomy and lectures on tuberculosis treatment and convalescent care at the New York University Medical College, formerly medical superintendent of the Sea View Hospital in Castleton Corners, N. Y., and the Tuberculosis Sanatorium of the New York City Department of Health in Otisville, N. Y., served as medical director of the New York Telephone Company, for many years on the board of visitors of the New York State Hospital, Ray Brook; chairman of the medical board, Tuberculosis Preventorium for Children, Farmingdale, N. Y., consulting physician to the Grasslands Hospital, Valhalla, N. Y., Mary Immaculate Hospital, Jamaica, and St. John's Long Island City Hospital, Long Island City, served on the medical board of the Stony Wold Sanatorium, Lake Kashaqua, N. Y., Workmen's Circle Sanatorium, Liberty, N. Y., and the Sanatorium Gabriels in Gabriels, received the degree of doctor of public health from New York University in 1921, died September 17, aged 66, of coronary thrombosis.

William Bradley Breed * Boston, Harvard Medical School, Boston, 1920, associate in medicine at his alma mater, member of the committee on publications, counselor and chairman of the war participation committee of the Massachusetts Medical Society, member of the New England Heart Association and the American Clinical and Climatological Society, fellow, regent and president of the board of governors of the American College of Physicians, associate editor from 1923 to 1937 and on the editorial board from 1937 to 1942 of the *New England Journal of Medicine*, specialist certified by the American Board of Internal Medicine, member of the honorary staff, at House of the Good Samaritan, since 1920 on the staff and at his death member of the executive committee of the Massachusetts General Hospital died in the Phillips House of the Massachusetts General Hospital August 21, aged 51, of carcinoma.

Jeremiah T. Simonson * New York, New York Homeopathic Medical College and Hospital, New York 1891, emeritus professor of pediatrics at his alma mater, now known as the New York Medical College, Flower and Fifth Avenue Hospitals, past president of the American Institute of Homeopathy, member of the American Academy of Pediatrics, specialist certified by the American Board of Pediatrics Inc., in 1941 received the gold certificate from his alma mater awarded to alumni who are still in active practice fifty years after graduation, consultant on the staffs of the Fitkin Memorial Hospital, Neptune, N. J., Metropolitan Hospital and the Yonkers General Hospital, Yonkers, N. Y., consulting pediatrician to the Lower and Fifth Avenue Hospitals, where he died September 30, aged 74 of hypernephroma of the right kidney and coronary sclerosis.

Joseph Marshall Flint, New Haven, Conn., Johns Hopkins University School of Medicine, Baltimore, 1900, for many years professor of principles and practice of surgery at the Yale University School of Medicine, at one time professor of anatomy at the University of California, San Francisco, fellow of the American College of Surgeons, served overseas during World War I commander of the Yale University Medical Unit and later commanding officer of Mobile Hospital number 39, named liaison officer, American Expeditionary Forces, when he left the service had been cited for conspicuous and meritorious service and was decorated by the French government, formerly chief surgeon at the New Haven Hospital and the New Haven Dispensary, died in Seal Harbor Maine September 16 aged 72 of coronary embolism.

Robert Law Cunningham * Los Angeles, Johns Hopkins University School of Medicine, Baltimore, 1907, clinical professor of medicine at the University of Southern California School of Medicine, specialist certified by the American Board of Internal Medicine, past president of the Clinical and Pathological Society, now the Los Angeles Academy of Medicine, Los Angeles Tuberculosis Association and the California Tuberculosis Association, fellow of the American College of Physicians, member of the American Trudeau Society and the National Tuberculosis Association, served on the staffs of the La Vina Sanatorium, La Vina, the Hospital of the Good Samaritan, Barlow Sanatorium and Children's and St. Vincent's hospitals, died September 10, aged 63 of coronary thrombosis.

Hugh Spencer McKeown * New York, Baylor University College of Medicine, Dallas, 1922, member of the American Academy of Ophthalmology and Otolaryngology, fellow of the American College of Surgeons, specialist certified by the American Board of Ophthalmology, served as assistant clinical professor of ophthalmology at the Columbia University College of Physicians and Surgeons, police surgeon of Bronxville and Westchester County, attending surgeon at the Institute of Ophthalmology of the Presbyterian Hospital, chief of the ophthalmologic service, Lawrence Hospital Bronxville, on the staff of the Vanderbilt Clinic, died in the Harkness Pavilion, September 14, aged 49, of coronary thrombosis.

Charles Henry Tilghman Lowndes * Medical Director, Rear Admiral, U S Navy, retired, Durham, N. C., University of Maryland School of Medicine, Baltimore, 1888, entered the medical corps of the U S Navy as an assistant surgeon on April 12, 1889, rose through the various grades to that of rear admiral in 1919, retired March 1, 1929 on own application after thirty years' service, formerly medical director of the Georgetown University Hospital, Washington, D. C., author of "Reports on Results of Indian Conditions on Various Reservations", died in the Naval Hospital Bethesda Md., September 25, aged 78.

Edward Luther Whitney * Walla Walla Wash., Balmore Medical College, 1895, served as president of the Walla Walla Valley Medical Society, specialist certified by the American Board of Internal Medicine, fellow of the American College of Physicians, formerly professor of physiologic chemistry at his alma mater and associate professor of physiologic chemistry, pharmacy and clinical pathology at the University of Maryland School of Medicine, member of the staffs of the Walla Walla General and St. Mary's hospitals, died September 13, aged 73, of bilateral hemiplegia.

Thomas Warren Allred * Nephi, Utah, Northwestern University Medical School, Chicago, 1923, served as county and city physician, president and for many years a member of the county board of education, died in the Payson City Hospital, Payson, August 6, aged 57.

Alexander Locke Anderson, Wolfville, N. S., Canada, Long Island College Hospital, Brooklyn, 1898, practiced in Brooklyn for nearly forty years, died June 29, aged 70.

Louis Baer * Philadelphia, Medico-Chirurgical College of Philadelphia, 1913, specialist certified by the American Board of Otolaryngology, served an internship at the Garretson Hos-

pital; on the staff of the Mount Sinai Hospital; died in the Pennsylvania Hospital August 4, aged 56.

Frederick Clifton Ballard * Rushford, N. Y.; University of Buffalo School of Medicine, 1898; for many years county coroner; for more than twenty years on the board of education of Rushford, serving at one time as president; health officer and school physician; on the staff of the Genesee Country Memorial Hospital, Fillmore; died August 16, aged 68, of cerebral hemorrhage and cirrhosis of the liver.

Robert Lenox Barnes * Columbus, Ohio; Starling-Ohio Medical College, Columbus, 1910; associate of the American College of Physicians; member of the American Heart Association, American Society for the Study of Arthritis and the Columbus Academy of Medicine; on the attending staff, Mount Carmel Hospital; died August 2, aged 58, of cerebral hemorrhage.

Philip John Bartle, Eugene, Ore.; Barnes Medical College, St. Louis, 1896; member and past president of the Oregon State Medical Society; past president of the Lane County Medical Society; member of the Pacific Northwest Medical Association; served as president of the Oregon Association of Hospitals; for many years on the staff of the Eugene Hospital and Clinic; died September 5, aged 70, of ruptured aortic dissecting aneurysm.

John A. Biever, Mount Joy, Pa.; College of Physicians and Surgeons, Baltimore, 1885; died August 27, aged 86, of carcinoma of the liver.

William Henry Blanchette * Fall River, Mass.; Baltimore Medical College, 1896; served during World War I; major, medical reserve corps, U. S. Army, not on active duty; died August 1, aged 71.

Braxton B. Blount, Punta Gorda, Fla.; Louisville Medical College, Louisville, Ky., 1890; examiner for the local Selective Service Board; died August 14, aged 79.

Walter William Brand * Toledo, Ohio; Jefferson Medical College of Philadelphia, 1894; fellow of the American College of Surgeons; honorary president of the Ohio Obstetrical Society; formerly health officer of Toledo; for many years on the staff of St. Vincent's Hospital; resigned as chief of staff in 1934 and as director of obstetrics in 1942 at the Women's and Children's Hospital, where he died October 2, aged 73, of cerebral thrombosis.

Henry George Crease * Bakersfield, Calif.; Jefferson Medical College, Philadelphia, 1891; formerly owner of the Trinity Hospital; died August 15, aged 78.

Annie Sturges Daniel * New York; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1879; for more than sixty years a member of the staff of the New York Infirmary for Women and Children; on the editorial board of the *Medical Woman's Journal*; author of "A Cautious Experiment"; died August 10, aged 85.

Cyril Ostello Dozer, Roseville, Ohio; Eclectic Medical College, Cincinnati, 1919; member of the Ohio State Medical Association; vice president of the school board; served during World War I; on the staff of the Bethesda Hospital, Zanesville; died in the Good Samaritan Hospital, Zanesville, August 21, aged 50.

Vernon King Stevenson Earthman, Shelbyville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1893; member of the Tennessee State Medical Association; veteran of the Spanish-American War and World War I; on the staff of the Rutherford Hospital, Murfreesboro; died August 8, aged 72, of coronary occlusion.

Charles Edward Eaton, Stanwood, Wash.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1904; member of the Washington State Medical Association; served during World War I; died at Camano Island August 21, aged 69.

Frank George Engelhardt, Syracuse, N. Y.; Syracuse University College of Medicine, 1892; veteran of the Spanish-American War; died August 18, aged 73, of carcinoma of the esophagus and stomach.

Wallace J. French, Pike, N. Y.; University of Buffalo School of Medicine, 1884; member of the Medical Society of the State of New York; health officer of the town of Pike; on the staff of the Wyoming County Community Hospital, Warsaw; died August 30, aged 85, of cerebral hemorrhage.

Alphonse Paul Gagnon, Taunton, Mass.; Tufts College Medical School, Boston, 1921; member of the Massachusetts Medical Society and the American Society of Anesthetists, Inc.; served an internship at the Fall River City Hospital, Fall River; examining physician of Selective Service Board num-

ber 148; formerly tuberculosis diagnostician of the board of health and chief of the staff of the Bay View Hospital in Fall River; on the staff of the Morton Hospital, where he died August 2, aged 52.

Clarence William Graser, Buffalo; University of Buffalo School of Medicine, 1918; member of the Medical Society of the State of New York; died in the Millard Fillmore Hospital August 20, aged 48, of cirrhosis of the liver.

Edward Melvin Green * Harrisburg, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1890; member of the American Psychiatric Association; fellow of the American College of Physicians; member, medical advisory board, Pennsylvania Selective Service; formerly on the staff of the Georgia State Sanitarium, Milledgeville; consultant in psychiatry and administration and for many years superintendent of the Harrisburg State Hospital; died September 30, aged 76.

Ralph Hagan, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1895; formerly police surgeon; served during World War I; on the staff of St. Vincent's Hospital, where he died August 20, aged 72, of angina pectoris.

John Albert Hagemann * Pittsburgh; Columbus Medical College, 1884; member of the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; formerly on the staff of the Pittsburgh Hospital; died July 15, aged 81, of pneumonia.

Thomas J. Heavey, Medway, Mass.; Middlesex College of Medicine and Surgery, Cambridge, 1922; member of the Massachusetts Medical Society; died August 7, aged 58.

Harry Joseph Hill, Waltham, Mass.; College of Physicians and Surgeons, Boston, 1910; formerly a medical missionary in China; served during World War I; at one time on the staff of the Northampton State Hospital, Northampton; a member of the staff of the Metropolitan State Hospital; died August 6, aged 59, of cerebral thrombosis, general arteriosclerosis and diabetes mellitus.

Thomas Milton Hood, Clarksburg, W. Va.; Jefferson Medical College of Philadelphia, 1880; honorary member and in 1905 president of the West Virginia State Medical Association; twice president of the Harrison County Medical Society; at one time assistant superintendent of the Weston State Hospital, Weston; on the staffs of the Union Protestant Hospital and St. Mary's Hospital; died, September 27, aged 91, of senility.

Lester Paul Hulick * Mansfield, Ill.; St. Louis University School of Medicine, 1925; served an internship at the Missouri Baptist Sanitarium, St. Louis; on the staff of the John and Mary E. Kirby Hospital, Monticello; died, August 20, aged 45.

Elmer C. Huselton, Pittsburgh; Jefferson Medical College of Philadelphia, 1884; formerly on the staff of the old Allegheny General Hospital; died August 24, aged 84, of heart disease.

Leon Downie Jay * Waverly, Iowa; State University of Iowa College of Medicine, Iowa City, 1910; fellow of the American College of Surgeons; on the staff of the St. Joseph Mercy Hospital; died August 8, aged 58, of cerebral hemorrhage.

William Robert King, Minneapolis; Harvard Medical School, Boston, 1917; served an internship at the Peter Bent Brigham Hospital, Boston; on the staff of the Abbott Hospital; died August 10, aged 54, of cerebral hemorrhage.

Silvanus B. Kirkpatrick, Taylor, Texas; Missouri Medical College, St. Louis, 1883; honorary member of the State Medical Association of Texas; died in the Stromberg Clinic and Hospital August 4, aged 92, of uremia.

Dantan Wyeth Landess, Port Allen, La.; University of Tennessee College of Medicine, Memphis, 1930; member of the Louisiana State Medical Society; served as health officer and coroner of West Baton Rouge Parish; a lieutenant colonel in the Louisiana State Guard, in which he had been commander of the seventh battalion; an organizer and past president of the Port Allen Lions Club; died in Our Lady of the Lake Sanitarium, Baton Rouge, August 21, aged 48.

Kevin David Lynch * El Paso, Texas; Columbia University College of Physicians and Surgeons, New York, 1911; member of the American Urological Association; president-elect and formerly vice president of the Southwestern Medical Association; served in France during World War I; on the staffs of the Hotel Dieu, Sisters' Hospital, Providence Hospital and the Southwestern General Hospital; died June 2, aged 58, of hypertensive heart disease.

Horace Cullford MacKerrow, Worcester, Mass.; Leonard Medical School, Raleigh, N. C., 1904; University of Bishop College Faculty of Medicine, Montreal, Que., Canada, 1905; died in the Palmer Memorial Hospital, Boston, August 14, aged 64, of metastatic adenocarcinoma from the biliary tract.

Rufus Henry Main, Barry, Ill.; Missouri Medical College, St. Louis, 1894; member of the Illinois State Medical Society and its "Fifty Year Club"; for eighteen years secretary of the Pike County Medical Society; for many years member of the school board; died August 20, aged 76.

Daniel Joseph Maloney, Waterbury, Conn.; New York University Medical College, New York, 1896; past president of the Waterbury Medical Association; on the staffs of the Waterbury and St. Mary's hospitals; died August 4, aged 77, of carcinoma of the stomach and general arteriosclerosis.

Herman Gustave Maul @ Denver; Denver and Gross College of Medicine, 1910; Army Medical School, 1915; member of the American Roentgen Ray Society and the Radiological Society of North America, Inc.; formerly an officer in the medical corps of the U. S. Army; major, medical reserve corps, U. S. Army, not on active duty; died August 13, aged 57, of injuries received when caught by a power saw.

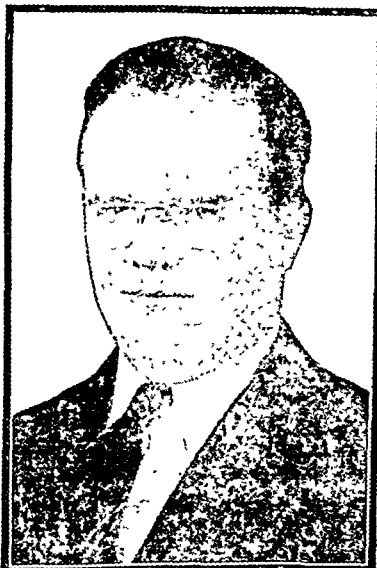
Caesar Peele McClendon, New Rochelle, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; died in Wells, Maine, August 31, aged 68, of heart disease.

Joseph N. Moore, Marshall, N. C.; University of North Carolina School of Medicine, 1905; for many years county physician; served as a member of the board of directors of the Aston Park Hospital, Asheville; died August 21, aged 60, of chronic myocarditis and carcinoma of the prostate.

Andrews Rogers, Columbus, Ohio; Columbia University College of Physicians and Surgeons, New York, 1901; since 1943 professor emeritus of obstetrics at the Ohio State University College of Medicine, where he had been professor from 1916; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; on the staffs of the Starling-Loving University Hospital, Mount Carmel Hospital, Franklin County Tuberculosis Hospital and the Grant Hospital; died August 6, aged 71.

Robert E. Ryle, Walton, Ky.; Starling Medical College, Columbus, 1896; member of the Kentucky State Medical Association; died August 30, aged 72, of myocarditis and arteriosclerosis.

John Gibson Sargent, Centralia, Wash.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1908; died July 26, aged 68.



CAPT. LEO E. APANASEWICZ
M. C., A. U. S., 1915-1944



CAPT. JACOB T. FARRIS
M. R. C., U. S. Army, 1916-1944

Henry Damon Smith @ Sanford, Fla.; University of Alabama School of Medicine, 1912; twice president of the Seminole County Medical Society; died August 12, aged 54.

William S. Steele, Bluefield, W. Va.; Baltimore University School of Medicine, 1893; died August 20, aged 76, of hepatitis.

Charles Nicholas Stroube @ Roachdale, Ind.; University of Louisville Medical Department, Louisville, Ky., 1897; died suddenly, September 17, aged 75, of coronary occlusion.

George Edwards Tooley, Seattle; Marion-Sims College of Medicine, St. Louis, 1901; member of the House of Delegates of the American Medical Association in 1908; formerly chief medical officer of the Veterans Administration Facility in Wichita, Kan., and on the staff of the Veterans Administration Facility in Lincoln, Neb.; served during World War I; died in August, aged 68, of myocardial infarct.

Herman Luther Tutwiler, Patterson, Va.; Medical College of Virginia, Richmond, 1900; member of the Medical Society of Virginia; formerly vice president of the McDowell (W. Va.) County Medical Society and member of the West Virginia state legislature; died July 29, aged 71.

William Franklin Waggoner, Carrollton, Ill.; Barnes Medical College, St. Louis, 1903; member of the Illinois State Medical Society; on the board of the Boyd Memorial Hospital; died in Macon, Mo., July 14, aged 77.

Thomas Francis Welch, Hartford, Conn.; Georgetown University School of Medicine, Washington, D. C., 1904; member of the Connecticut State Medical Society; president of the Hartford Medical Society in 1932; served as a member of the draft board of Hartford during World War I; member and past president of the staff of St. Francis Hospital; died July 19, aged 71, of cerebral thrombosis.

Cephas John Wells @ Bartlesville, Okla.; Louisville Medical College, 1894; died September 9, aged 79, of congestive heart disease.

James Alexander White, Alexandria, La.; College of Physicians and Surgeons, Baltimore, 1892; member of the Louisiana State Medical Society; member of the board of directors and treasurer of the Louisiana College, Pineville; on the staff of the Baptist Hospital; died May 23, aged 76, of coronary thrombosis.

James Johnston Withers, Davidson, N. C.; Jefferson Medical College, Philadelphia, 1909; served during World War I; formerly a druggist; on the visiting staff of the Lowrance Hospital, Mooresville; died July 30, aged 64, of coronary occlusion.

KILLED IN ACTION

Leo Edwin Apanasewicz, Cleveland; St. Louis University School of Medicine, 1941; served an internship at St. John's Hospital; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 25, 1942; later promoted to captain; served in the North African and Italian campaigns; died in an army hospital in England, June 15, aged 28, of wounds received in Normandy on D day, June 6.

Jacob Thomas Farris, Richmond, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1940; served

an internship in pediatrics at the Strong Memorial Hospital and the Rochester Municipal Hospital, Rochester, N. Y.; commissioned a first lieutenant in the medical reserve corps of the U. S. Army in June 1940; began active duty on Aug. 25, 1941; promoted to captain in January 1943; stationed at hospital in Fort Knox, Kentucky, for one year and trained in various other posts in the U. S. Army before going overseas early in January 1944; landed with the invasion troops in Normandy on D day; twice cited for bravery and awarded the Silver Star; killed in France by shrapnel severing his spinal cord August 3, aged 27.

Bureau of Investigation

DANGEROUS TO HEALTH

Because of Inadequate Warnings on Labels

[Editorial Note—These abstracts concern preparations which were specifically declared by the Food and Drug Administration of the Federal Security Agency to be misbranded because their labels failed to carry adequate warnings against giving them to children, or using them in the pathologic conditions in which they might be dangerous to health, or to caution against unsafe dosages or methods or duration of administration or application, for the protection of the user. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Aurofectol Purpoil No 22 and Purpoil No 600—Purpoil Laboratories Inc., Baltimore. Shipped March 9 and 25 1942. Composition: Aurofectol essentially a mixture of oils and phenols. Purpoil Nos 22 and 600 both essentially mineral oil with small quantities of iodine chlorbutanol and menthol. Aurofectol adulterated because strength differed from which label represented it to possess, since it was not an antiseptic. Misbranded because label falsely represented that product would be efficacious in treating dermatitis, eczema, acute catarrhal inflammation of tympanic membrane, acute and chronic infections of external auditory canal, acute myringitis and catarrhal otitis media, that it was an effective parasiticide and antiseptic in skin diseases and would produce desired results in treating infections of the skin of the external auditory canal. Purpoil products misbranded because labels failed to warn adequately against use by children or in those conditions wherein products might be dangerous to health since frequent or excessive use might cause injury to the lungs. Purpoil No 22 further misbranded because label falsely suggested that product was in effective treatment of acute and mild chronic infections of the nose, would cause a depletion of the swollen mucous membrane, promote drainage greatly improve ventilation and gradually diminish excess discharge, regardless of its cause. Both Purpoil products also misbranded because falsely represented to have bacteria destroying properties equivalent to phenol in the same strength and in the same type of oil. Purpoil No 600 specially misbranded because of false statement "Used in the treatment of chronic suppurative infections of the nose."—[D D N J, F D C 759, September 1943]

Luebert's Iron Tonic Compound Tablets—A. G. Luebert, Wilmington Del. Shipped May 17 and June 27, 1941. Composition: essentially salts of iron and manganese, strychnine sulfate, arsenic trioxide, a phosphide, and fish oil. Misbranded because label failed to warn against giving product to children and elderly persons in view of strychnine content, or to caution against taking more than the recommended dose and against frequent or continued use because of strychnine and arsenic content, further misbranded because of label misrepresentation that product would produce rich blood, good health, strong nerves and astounding vitality, give strength and vigor to the entire system, cleanse the blood after accumulations of winter months, benefit the weak, run down or depressed, produce proper activity of all organs and functions of the body, stimulate the nutritive functions, tone the digestive tract and benefit those conditions which call for an effective tonic such as loss of appetite and a tired, run-down feeling. Further misbranded because of false representation that these tablets were solely an iron tonic since they contained some additional drugs that were physiologically active, also misbranded because label failed to declare quantity or proportion of strychnine sulfate and arsenic trioxide.—[D D N J, F D C 754, September 1943]

Pond's Digestans and Pond's Laxative Pills—Pond Pharmaceutical Company, Inc., New York. Shipped Oct 8 and Nov 13, 1941. Composition: Digestans essentially sodium bicarbonate, peppermint oil, strychnine sulfate and extracts of laxative plant drugs including aloin. Laxative Pills essentially laxative plant drugs (including aloin and podophyllin) and small amounts of belladonna. Both articles misbranded because directions for use were inappropriate and inadequate for a laxative since they provided for continued administration which might establish the laxative habit, further misbranded because, though label cautioned user against taking laxatives in the presence of nausea, vomiting and abdominal pain, it failed to warn that such symptoms may be those of appendicitis, also misbranded because tablets contained strychnine but labeling failed to warn that not more than the recommended dosage should be taken and that use by children and elderly persons might be especially dangerous, misbranded further because warnings required by law were not conspicuous on the label. Misbranded again because of certain label misstatements regarding the action of ingredients of Digestans and because the Laxative Pills were not properly labeled as to active ingredients and quantity of contents.—[D D N J, F D C 764, September 1943]

W. K. Sterline's Compound—Walter K. Sterline, trading as W. K. Sterline, Silesia, Ohio. Shipped Dec 30, 1940. Composition: alcohol 15 volume, 5% per cent a.i. in each fluid ounce 15.25 grains of potassium iodide and 14.46 grains of sodium bromide. Misbranded because label failed to bear adequate warnings against giving to children or taking it in the pathologic conditions wherein it might be dangerous to

health or against unsafe dosage, since, because of presence of potassium iodide, it should not be taken in cases of lung disease, chronic cough or goiter, and should be discontinued if a skin rash should appear, frequent or continued use might lead to mental derangement, skin eruptions or other serious effects. Also dangerous to health because, considering presence of sodium bromide, product should not be used by those suffering from kidney disease. Misbranded, also, because labels failed to state that product should not be administered to children under 6 years of age, and because they falsely declared the amounts of alcohol, potassium iodide and sodium bromide present.—[D D N J, F D C 806, December 1943]

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Casafra—In February 1944 Leo J. Dunn, trustee trading as Mason Drug Company, Boston, entered into a stipulation with the Federal Trade Commission regarding this product. In this he agreed to discontinue any advertisement which did not reveal that Casafra should not be taken when abdominal pain, nausea or other symptoms of appendicitis are present. It was provided however, that future advertisements need contain only the statement "Caution: Use Only as Directed" if the instructions for use on the label should contain a warning to the same effect.

Dr. Edgar Health Shoes and Dr. Edgar Health Cushion Shoes—In March 1944 A. J. Schoenecker and Margaret Wehse, copartners trading as A. J. Schoenecker Shoe Company, Milwaukee, stipulated with the Federal Trade Commission that they would no longer use the descriptions "Dr. Edgar Health Shoes" and "Dr. Edgar Health Cushion Shoes" in advertising branding or labeling the shoes that they sell, or the word "Doctor" or its abbreviation, either alone or with the word "Health," so as to imply that their shoes have been made in accordance with the design or under the supervision, of a physician, or contain special scientific orthopedic or health features which are the result of medical determination or services. They further agreed to discontinue representing through use of the word "Manufacturers" that they make the shoes that they sell or own and operate or directly and absolutely control the factory in which their shoes are made.

Hennafoam Shampoo—This is put out by Alfred Horowitz, trading as Hennafoam Shampoo Company, New York City. In February 1944 he stipulated with the Federal Trade Commission that he would cease representing that the product has been tested, or tested and approved by Good Housekeeping Magazine or any other organization which it owns or controls, unless the tests have been made in such manner as to give reasonable assurance of its quality, nature and properties in relation to its intended use and to the fulfillment of the claims made for it.

Kondremul with Non-Bitter Extract of Cascara and Kondremul with Phenolphthalein—These are products of the E. L. Patch Company, Boston. In February 1944 this concern entered into a stipulation with the Federal Trade Commission to discontinue any advertisement which did not reveal that the preparations should not be used when abdominal pain, nausea or other symptoms of appendicitis are present. It was agreed however that it would be sufficient for future advertisements to contain the statement "Caution: Use Only as Directed" if and when the directions for use on the labels should carry a warning to the same effect.

Lashgro—This is promoted by Bertrice Kornstein, trading as Avalon Lane Company, New York. In February 1944 she stipulated with the Federal Trade Commission that she would cease representing by use of the trade name "Lashgro" or otherwise that her product causes the eyelashes to grow longer or thicker, will promote or in any way affect their growth or correct or remedy red, scaly eyelids.

Stevens' Mineral Water, Stevens' Concentrated Mineral Water, and Stevens' 50-50 Water—These were the subjects of a stipulation entered into with the Federal Trade Commission in March 1944 by F. A. Stevens of Dawson Springs, Ky., in which he agreed to discontinue the following misrepresentations in the advertising: That these waters are in effective treatment or relief for stomach trouble, acute or chronic nephritis, uremia, engorged liver or kidneys, rheumatism, gout, gall stones, dropsy, appendicitis and some other ailments; that the waters are a cure for chronic constipation or a treatment for that condition in excess of temporarily relieving it; or that the physiologic effects of the preparations are greater than those of a saline laxative and a weak antacid. He further agreed to discontinue any advertisement which represented that the use of these waters was safe, or which failed to reveal the potential danger in using them when abdominal pains, nausea or other symptoms of appendicitis are present. The stipulation provided, however, that when the potential danger in their use was noted on the label, a statement need contain only the warning "Caution: Use Only as Directed."

Correspondence

POWDER FOR SURGICAL GLOVES

To the Editor—An editorial in THE JOURNAL, September 23 entitled "Exit Talcum from the Surgical Scene" has provoked considerable comment among industrial hygienists. There you make the statement that "These lesions [the talc granulomas] are permanent because the body does not have adequate reparative power against talcum, which is essentially a silicate and which therefore induces a silicosis."

I would question the validity of the assumption that a silicate can cause silicosis, and several people have already written me to protest against your generalization. All experimental evidence derived from study of pure silicates indicates that as a class these minerals do not dissolve within the body to liberate their component silica with resultant fibrosis. In fact most of the silicates are inert materials and only a few of them, like asbestos and possibly mica, may be irritating because of peculiar physical properties. These experimental results, based on the study of pure minerals, are not always applicable to the mixtures encountered in industry. Many dusts are named for their major component but analysis reveals that they contain significant quantities of quartz that may be responsible for pulmonary reactions noted in chest roentgenograms.

In the case of talc I know that contamination with quartz is responsible for some of the alleged reactions in the lungs. In other instances nomenclature is at fault and the inhaled minerals actually consist of mixtures of tremolite, anthophyllite (both fibrous silicates), serpentine and either granular or fibrous talc. The fibrous minerals produce the peculiar bodies found in asbestosis and, in my opinion, pulmonary reaction to these so-called "talc" is due to their fibrous structure rather than to their silica content. They produce granulomas only when the particles are fairly large, 20 microns or more in length. Grinding them to 3 microns or less in maximum diameter renders them comparatively inert so that tissue reaction is limited to simple phagocytosis. With crystalline silica, whose action is known to be chemical, the reverse is true and the finer the quartz the more irritating it becomes.

The talcum powder granulomas of the peritoneal cavity are obviously foreign body tubercles, for all observers have mentioned the detection of refractile mineral particles. The size of these particles is not usually mentioned, but they must obviously be quite large to be detected under the biologist's polarizing microscope. Petrographic examination of one commercial talcum for hospital use revealed particles and fibers ranging in size from 150 microns downward. This material consisted of fibrous tremolite and particulate talc, dolomite and serpentine. Other samples contained varying amounts of quartz. Experiment demonstrates that intraperitoneal injection of the untreated powder will produce foreign body tubercles, after regrounding to size 3 microns and under (the size at which quartz exerts its specific effects) intraperitoneal reaction is limited to phagocytosis. Fibrosis develops only about large accumulations of the powder, and this is a nonspecific reaction against the mass of foreign body. Regardless of particle size reactions to talc are not progressive.

For the reasons cited I cannot subscribe to your explanation of the talc granuloma. "Reparative power" is involved only in the sense that the tissues have walled off an insoluble foreign body. I can discover no reason for considering such reaction an attempt to repair a chemical injury. The hypothesis that body fluids attack silicates and leach out the bases to leave silica in active form finds no support in controlled experimental observation.

LEROY U. GARDNER, M.D., Saranac Lake, N. Y.

Director, Saranac Laboratory for Study of Tuberculosis

To the Editor—I have been much interested in the discussion going on for some time about a substitute for talcum powder in operating room gloves.

Why do we need any substitute? If gloves are dry and hands are dry, as they should be, and the gloves are the right size, any foreign material unnecessarily introduced into the field is an added danger. I have been wearing rubber gloves in the operating room for over forty years and have never used any kind of glove powder. In these days of constantly changing operating room nurses I have to be on the alert to escape the avalanche of talcum with which I am constantly threatened, but so far I have valiantly held my ground and have gone into the operating room with fingers that are cleaner and have a better tactile sense.

This tendency to get rid of an evil thing by substituting another evil thing is a common fault in everyday thinking. There is no need to have a substitute for a nuisance.

DANIEL THOMAS QUIGLEY, M.D., Omaha

'GETTING PATIENTS OUT OF BED EARLY IN THE PUERPERIUM'

To the Editor—On page 839 of THE JOURNAL of July 22 Dr. Morris L. Rotstein of Baltimore makes the statement that during the blitz of 1940-1941 London maternity patients delivered in hospitals were allowed up a day after labor and sent home on the second or third day post partum. He adds that "no ill effects resulted from this mode of treatment."

It would seem that Dr. Rotstein is under some misunderstanding, for although one half of the institutional confinements in London take place in hospitals directly under my control and I am in close touch with the voluntary hospitals responsible for the remaining institutional births in London, I have never heard of such a routine. The true facts may interest your readers. During the whole war period, all expectant mothers who could be persuaded to leave London were evacuated at the eighth month to country maternity homes organized by the Ministry of Health and there they were retained until the usual fourteen days after confinement. At the end of this period they were discharged to country billets with their infants, but many returned soon after to their homes in London, especially if the blitz was not active.

Of the mothers who could not be persuaded to leave London those who were normal medically and whose homes were suited for confinements were expected to have their babies at home. This is the usual prewar custom in England, and we did not depart from it during the blitz, but of course enemy action rendered many houses unsuitable and added to the pressure on our beds. Further, all hospitals retained the fourteen day period during the early part of the war, but many (including the London County Council's hospitals) were obliged to reduce the mothers' stay to ten or twelve days as accommodation was reduced by bombing or by necessary air raid precautions. Any woman who had to be sent home earlier (which very rarely happened and never before the seventh day) was conveyed by ambulance and a visiting nurse was sent to care for her. It is also true that in two areas of London where hospital accommodation became very short the women were (and are still) transferred by ambulance to a suburban hospital with excellent accommodation on the fourth day, but they are not expected to go home till the twelfth day. No bad effects have been reported but the arrangement is much disliked by the women and will be abandoned directly events permit. It is probably a garbled version of this plan which has reached Dr. Rotstein.

May I add that we have had many attempts in the last forty years to introduce a shortened puerperium into English mid-

were practice but they have never taken hold. The present tendency is to insist more firmly than ever on six to seven days in bed and a total fourteen days of rest and exemption from household duties with a longer convalescence still after complicated confinements. The value of graduated physical exercises during the antepartum period and from the third or fourth day of the puerperium is of course widely appreciated.

ALLEN DALEY, M.D.,
Medical Officer of Health, London County Council

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Chiropractic Practice Acts: Revocation Proceedings Not Barred by Failure of the Licensite to Renew License.—The state of Iowa in February 1943 instituted proceedings to revoke Otterholt's license to practice chiropractic in Iowa charging that the chiropractor was guilty of wilful and repeated violations of the Iowa laws relating to the practice of the healing arts. It was alleged that the chiropractor had repeatedly not confined his practice to chiropractic and had treated his patients "with electric and other machines which is not the proper practice of chiropractic but is the practice of medicine and surgery for which he has no license. It was also alleged that the chiropractor was guilty of fraud and misrepresentations as to his skill and ability "in using a machine termed a 'Pathoclast' of no therapeutic value and falsely representing its therapeutic value." The chiropractor moved to dismiss the action, questioning the authority of the state to institute the action and the constitutionality of the state laws relating to the healing arts. Under the applicable Iowa law every license to practice a profession expires annually on the 30th day of June but can be renewed without examination on application accompanied by the legal fee at least thirty days prior to the expiration of the license. The chiropractor permitted his license to expire and did not apply for a renewal thereof. Subsequently he amended his motion to dismiss and contended that since he no longer was licensed to practice the action should be dismissed because the question of cancellation of his license was now moot. The trial court sustained the motion "on ground that cause of action has ceased to exist." The state accordingly appealed to the Supreme Court of Iowa.

The chiropractor said the Supreme Court, had the right to practice chiropractic by virtue of the license granted by the state acting under its police power. Such practice involves the health and safety of the citizens of the state and practice under such license is subject to all reasonable conditions and regulations. Among such conditions is the requirement of annual renewal. This court on many occasions has sustained the right of the state to regulate the practice of the healing art and the constitutionality of the laws on the subject now in force. Through the license to practice granted the chiropractor by the state subject to the regulations referred to the chiropractor is the possessor of a valuable privilege or right "which cannot be denied or abridged in any manner except after due notice and a fair and impartial hearing before an unbiased tribunal" (*Gilchrist v. Burring* 14 N. W. (2d) 724). The state cannot by issuing only annual licenses ingeniously thwart those precious rights and once an annual license is issued to a [licensite] unless he has violated some of the provisions of the statute applicable to his profession he is entitled to the renewal of his license as a matter of right.

The Supreme Court did not agree with the holding of the trial court that the cause of action against the chiropractor had ceased to exist when the chiropractor failed to renew his license. There is a marked difference said the court between a license to practice a profession and a mere renewal of that license. As was said by this court in *Gilchrist v. Burring* supra

This is because a dentist, doctor, lawyer or the member of any other profession does not devote the years of study and preparation necessary to qualify as a practitioner merely that he may be accorded the right to practice for one year. When he qualifies for the practice, he does so for life. That right cannot be taken from him except by due process of law.

The certificate entitling the chiropractor to practice is a finding by the duly constituted authority that he has the necessary character and qualifications to practice chiropractic. The mere failure to renew annually does not lessen the value of that license except for the lapsed period before the renewal. The chiropractor is still the owner of the license and may be reinstated and continue the practice of chiropractic without examination, subject as always to the supervisory power under which he previously exercised it such right to practice being evidenced by its renewal. All benefits of his license did not expire on July 1 1943. His rights under the original license are of value. To deprive him absolutely and finally of the right ever to practice is much more serious than the mere suspension of that right, either voluntary or compulsory. Contrary to the procedure in renewal, in which one who is not an offender against the rules regulating the practice is entitled to a renewal as a matter of right one who has had his license revoked must commence anew by making an original application for another license. *Hanson v. State Board of Medical Examiners* 220 Iowa 357, 260 N. W. 68.

We do not consider the question involved moot, merely because the chiropractor is not at present making full use of his license to practice. As stated in 3 American Jurisprudence 366.

It may be noted that the question whether a provision in a decree confers a particular right upon a party is not rendered moot on appeal merely because such party testified at the trial that he did not expect to exercise such right.

To hold otherwise places in the hands of the accused practitioner himself the power to escape the penalty provided by law for a violation of the rules governing the conduct of his practice, no matter how gross his misconduct may have been. The cause of action has not ceased to exist so long as there remain rights undetermined and all matters involved in the action have not been adjudicated. We are satisfied that the cause of action has not ceased to exist.

The Supreme Court accordingly ordered the cause to be returned to the trial court for trial on the merits—*State v. Otterholt* 15 N. W. (2d) 520 (Iowa 1944).

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL Oct. 21, 1943 515.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. Parts I and II. Various centers. Nov. 13-15. Part III. Various centers, October. Exec. Sec., Mr. I. S. Howard. 225 S. 15th St. Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILIGOLOGY. New York. June 8-9. Final date for filing application is March 12. Sec., Dr. George M. Lewis. 66 E. 66th St., New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE. Written. Feb. 19. Final date for filing application is Dec. 15. Asst. Sec., Dr. W. A. Werrell. 1501 University Ave., Madison 5, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY. Spring 1945. Final date for filing application is Feb. 1. Sec., Dr. Paul C. Bucy. 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY. Written. Part I. Various centers. Feb. 3. Sec., Dr. Paul Titus, 1015 Highland Bld., Pittsburgh 6.

AMERICAN BOARD OF Ophthalmology. Written. Various centers. October, 1944. Final date for filing application is Dec. 1. Sec., Dr. S. Judd Beach. 56 Erie St., New York. Chicago. Dec. 1. Sec., Dr. J. C. Hirsch.

AMERICAN BOARD OF PEDIATRICS. Oral. New York. April 14-15. Final date for filing application is Dec. 15. Chicago. May 19-20. Final date for filing application is Jan. 19. Sec., Dr. C. A. Aldrich, 1157, First Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY. Oral. New York. June. Final date for filing application is May 1. Sec., Dr. B. R. Kirklin. 102-119 St. 1st Ave. S.W., Rochester, Minn.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

28:133-268 (Aug.) 1944

- Measurements of Circulation in Patients with Multiple Arteriovenous Connections. J. A. Kennedy and C. S. Burwell.—p. 133.
- Fusion Beats and Their Relation to Syndrome of Short PR Interval Associated with Prolonged QRS Complex. J. S. Butterworth and C. A. Poindexter.—p. 149.
- On Apical Sounds and Murmurs in Aortic Regurgitation. A. A. Luisada.—p. 156.
- Unusual Effect of Interpolated Ventricular Premature Systoles. L. N. Katz, R. Langendorf and S. L. Cole.—p. 167.
- Relation of Neurocirculatory Asthenia to Graves' Disease. E. Moschowitz and S. S. Bernstein.—p. 177.
- Further Observations on Deep Q₂ of Electrocardiogram. Annie Mary Lyle.—p. 199.
- Peripheral Blood Flow and Other Observations in Coarctation of Aorta. H. J. Stewart, Helen S. Haskell and W. F. Evans.—p. 217.
- *Differentiation of Electrocardiographic Changes Produced in Dog by Prolonged Temporary Occlusion of Coronary Artery from Those Produced by Postoperative Pericarditis. R. H. Bayley and J. S. La Due.—p. 233.
- Effect of Dehydration Produced by Mercupurin on Plasma Volume of Normal Persons. R. H. Lyons, N. L. Avery and S. D. Jacobson.—p. 247.

Electrocardiographic Changes in Coronary Occlusion and Postoperative Pericarditis.—Bayley and La Due describe experiments on dogs which were devised to test the interpretation offered by Blumgart and his co-workers concerning the "prolonged" electrocardiographic changes associated with experimental temporary occlusion of a coronary artery. The authors present a method by which the electrocardiographic changes due to experimental coronary occlusion may be differentiated from those caused by the associated postoperative pericarditis. They show that the changes in the final ventricular deflections which are due to experimental temporary coronary occlusions of fifty minutes or less vanish completely within thirty minutes after cessation of occlusion and that the changes which appear on and after the first postoperative day are caused by local postoperative pericarditis. The duration of the electrocardiographic changes which immediately follow cessation of occlusions of fifty minutes or less is directly proportional to the duration of the occlusion. There are no differences in the magnitude or in the kind of electrocardiographic changes which are produced by acute local ventricular ischemia and injury, on the one hand, and by local postoperative pericarditis, on the other. The former occur during and for a brief time after temporary occlusion. For the most part the latter occur on and after the first postoperative day. The site of generation of the electrical effect which account for the two etiologically different groups of changes is different, i. e. the electrical effects associated with occlusion are generated in the muscle ordinarily irrigated by the occluded artery, whereas those associated with postoperative pericarditis are generated by the muscle adjacent to the local epicarditis which results primarily from the trauma of dissection of the coronary artery and from the trauma caused by the sutures which are used to close the pericardial sac. These observations differ decidedly from those of Blumgart and his co-workers. The authors ascribe the differences to the use by the other investigators of extremity leads only. It is important not to rely entirely on extremity leads for an evaluation of the electrocardiographic changes which occur in association with animal experimentation.

American Journal of Medical Sciences, Philadelphia
208:141-280 (Aug.) 1944

- Use of Gelatin Solutions in Treatment of Human Shock. D. D. Kozoll, H. Popper, F. Steigmann and B. W. Volk.—p. 141.
- Increases in Plasma Volume Following Administration of Sodium Salts. R. H. Lyons, S. D. Jacobson and N. L. Avery.—p. 148.
- Orientation of Army Psychiatrist. P. Haun.—p. 154.
- Convulsive Shock Therapy in Involutional States After Complete Failure with Previous Estrogenic Treatment. A. E. Bennett and C. B. Wilbur.—p. 170.
- Endocrine Factor in Homosexuality: Report of Treatment of 4 Cases with Androgen Hormone. L. A. Lurie.—p. 176.
- *Sulfamerazine (2-Sulfanilamido-4-Methylpyrimidine): II. Sulfonamide Concentrations in Blood of Man Produced by Small, Daily, Oral Doses of Sulfamerazine, Sulfamethazine, Sulfadiazine and Sulfathiazole. A. D. Welch, P. A. Mattis, E. S. Koelle and A. R. Latven.—p. 187.
- Studies on Bone Marrow in Vitro: II. Effect of Hemoglobin and Red Cell Stromata on Explanted Bone Marrow. M. Rachmilewitz and A. Rosin.—p. 193.
- Cardiac Arrhythmias in 1,000 Cases of Pulmonary Tuberculosis. T. T. Fox and A. L. Bobb.—p. 201.
- *Significance of Marked Left Axis Deviation of Electrocardiogram. J. M. Faulkner and C. N. Duncan.—p. 205.
- Development of Hypertension Associated with Lesions of Kidney. H. O. Mosenthal.—p. 210.
- Studies on Morphology of Adrenal Cortex and on Excretion of 17-Ketosteroids in Hypertensive Patients. M. Bruger, J. A. Rosenkrantz and B. E. Lowenstein.—p. 212.
- Factors Influencing False Positive Serologic Reactions for Syphilis Due to Smallpox Vaccination (Vaccinia). G. O. Favorite.—p. 216.
- Phosphorus Poisoning: Report of 16 Cases with Repeated Liver Biopsies in Recovered Case. J. S. LaDue, J. R. Schenken and L. H. Kuker.—p. 223.
- Acute Meningococcal Encephalomyelitis. W. B. Wartman and I. C. Hanger.—p. 234.
- Mumps Epidemic in Small Task Force. H. Dermon and E. W. LeHew.—p. 240.

Sulfonamide Concentrations in Blood.—The experiments by Welch and his collaborators were designed to compare concentrations of sulfonamide produced in the blood of normal human subjects by daily administration of a single small dose of sulfamerazine, sulfadiazine, sulfamethazine or sulfathiazole. Observations were made on the average sulfonamide concentrations produced in the blood of 8 normal men by daily 1 Gm. doses of these drugs. The concentration in the blood following maintenance doses of sulfamerazine fell from a daily maximal value of about 6.5 to a minimal value of about 3.5 mg. per hundred cubic centimeters, with sulfadiazine from about 3.5 to about 1.5, with sulfamethazine from about 4 to less than 1, and with sulfathiazole from about 2 to less than 1 mg. per hundred cubic centimeters. Sulfamerazine administered in single 0.5 Gm. daily doses maintained a concentration in the blood which fell gradually from a level of approximately 4 to a level of about 2 mg. per hundred cubic centimeters. Emphasis is placed on the rapid absorption and gradual elimination of sulfamerazine, which make possible the maintenance of a concentration in the blood, with single daily doses of only 0.5 to 1 Gm., that is probably sufficient for certain chemoprophylactic purposes. The data presented, as well as clinical experience with sulfamerazine, indicate that adequate therapeutic concentrations in the blood should be maintained by the administration of smaller total daily doses than with other sulfonamides; these doses can be given on the basis of only two or three divided doses daily.

Significance of Great Left Axis Deviation.—While it is generally recognized that moderate deviation of the electrical axis of the heart to the left is a common finding in normal persons, its frequency approximating 20 per cent, there appears to be little agreement as to the significance of the less frequent but by no means rare pattern of great left axis deviation in which S₂ is of greater amplitude than R₂. Faulkner and Duncan studied clinical records of 200 consecutive cases exhibiting this pattern. The records revealed that 51.5 per cent had no left ventricular enlargement. Measurements of the heart from tele-roentgenograms in 97 cases were within normal limits in 35. The heart was normal anatomically in 8 of 27 cases subjected to necropsy. There was a definite increase in the incidence of the pattern in the older age groups. The authors conclude that great left axis deviation in an otherwise normal electrocardiogram is a normal variation which, though encountered with increasing frequency with advancing age, cannot be correlated with ventricular enlargement, coronary disease or myocardial disease.

American J. Obstetrics and Gynecology, St. Louis

48:149-298 (Aug) 1944 Partial Index

- Pelvic Model Manikins to Show Pelvic Shape and to Demonstrate Labor Mechanisms H C Moloj —p 149
- Herpes Gestations with Report of 2 Cases and Survey of Literature C W Mueller and W A Lapp —p 170
- Oral Substitution Therapy with Ethinyl Estradiol and Alpha Estradiol F E Harding —p 181
- Hysterosalpingography, Routine Aid in Gynecologic Diagnosis P Bernstein —p 189
- Validity of Two Hour Rat Test for Human Pregnancy E J Ferris —p 200
- Status of Infant at Birth as Related to Basal Metabolism of Mother in Pregnancy L W Sontag, E L Reynolds and Virginia Torbet —p 208
- Experimental Basis for Chemotherapy of Trichomonas Vaginalis Infections H R E Trussell and G Johnson —p 215
- Salmonella Cholerae Suis Bacteremia During Pregnancy E R Meter, L A Siegel and Phyllis Clark —p 222
- Control of Menorrhagia by Prolactin H S Kupperman, P Fried and L Q Hair —p 228
- Cesarean Section Under Continuous Caudal Analgesia Supplementary Report C B Lull and J C Lilly —p 235
- *Acute Pelvic Thrombophlebitis Treated with Continuous Caudal Anesthesia G J Ellis and J B Sheffery —p 241
- Vaginal Antiseptics Comparative Study of Bimphen Solution in 910 Consecutive Deliveries R R Gates —p 246
- Vitamin and Endocrine Therapy in Nausea and Vomiting of Pregnancy B F Hart, W T McConnell and Alice N Pickett —p 251
- Further Studies on Intrauterine Sulfanilamide Packs W E Brown —p 254
- Eclampsia Without Convulsions Hypertension or Coma R A Reis and L A Bernick —p 257
- Report of 67 Consecutive Postpartum Sterilizations B Diamond —p 260
- Brenner Tumor of Ovary Associated with Sarcomatous Change in Fibromyomatous Uteri B R Austin and G W Ramsey —p 263
- Spontaneous Postpartum Disappearance of Massive Condylomata Acumina of Vulva W Foster —p 266

Continuous Caudal Anesthesia in Acute Pelvic Thrombophlebitis—During the past six months Ellis and Sheffery have used continuous caudal anesthesia in 10 cases of acute pelvic thrombophlebitis with excellent results. Two typical cases are reported. The authors feel that the caudal method has several advantages over the regional sympathetic block of the first, second, third and fourth lumbar sympathetic ganglions. Regional injection requires four punctures, caudal but one. The continuous bathing of the sympathetic chain for several hours is preferable to the one injection technique necessitated by the regional block method. In caudal nerve block it is possible to tell when the needle is correctly placed by the classic signs such as sciatic pain, progressive regional anesthesia, sphincter relaxation and vasodilatation of the extremities. In sympathetic nerve block one cannot be sure that all the ganglions have been correctly injected. In acute thrombophlebitis the authors give 30 cc (low caudal) every hour until four doses have been given. This intermittent method of injection has the advantage that, if there is a tendency for the vasoconstriction to reestablish itself after the effect of the drug wears off, the impulse can be immediately released again by the next injection.

American Journal of Psychiatry, New York

101:1-140 (July) 1944 Partial Index

- Current Trends in Military Neuropsychiatry M J Farrell and J W Appel —p 12
- Psychiatry in the British Army J R Rees —p 20
- Psychiatrist Looks at Child Psychiatrist K M Bowman —p 23
- Role of X Rays in Study of Local Atrophic Lesions of Brain A E Child and W Penfield —p 30
- Observations on Patterns of Anxiety D E Cameron —p 36
- Clinical and Electroencephalographic Studies Correlations of Mental Electroencephalographic and Anatomic Changes in Cases with Organic Brain Disease H Struss —p 42
- Insulin Shock Therapy After Seven Years E D Bond and T D Rivers —p 62
- Group Psychotherapy Superior Method of Treating Larger Numbers of Neurotic Patients S B Hadlen —p 68
- Development of Research Program in Mental Deficiency Over a Fifteen Year Period R H Haskell —p 77
- Nature of Psychogenic Cure C P Oberndorf —p 91
- Quantitative Use of Rorschach Method Instability and Disability Ratings Which Show Clinical and Psychometric Correlations W D Koss —p 100
- Stirile Neurosis F C Thorne —p 103
- Effect of Electric Shock Therapy on Cerebrospinal Fluid Pressure, Protein and Cells J S L Jacobs —p 110
- Review of Psychiatric Progress in Ibero America A C Pacheco e Silva —p 113

American Journal of Tropical Medicine, Baltimore

24:221-280 (July) 1944

- Renewed Clinical Activity in Naturally Induced Vivax Malaria M T Boyd and S F Kitchen —p 221
- Observations on Possible Usefulness of Complement Fixation Test in Early Diagnosis of Yellow Fever Alina Perlowagora and E H Lennette —p 235
- Yellow Fever Control During War C L Williams —p 245
- Consideration of Certain Problems Presented by Case of Strongyloidiasis E D Palmer —p 249
- Behavior of Trichomonas Vaginalis in Semisolid Medium M J Hogue —p 255
- *Vitamin C and Ability to Work in Hot Environments A Henschel, H I Taylor, J Brozek, O Mickelsen and A Keys —p 259
- Medical Care in Belgian Congo C A Flood and W Sherman —p 267
- Apparatus to Facilitate Feeding of Insects on Laboratory Animals A Pachchanian —p 273

Vitamin C and Ability to Work in Hot Environments.

—According to Henschel and his associates claims have been made that large ascorbic acid intakes are of immediate benefit in exposures to high temperature of relatively short duration. The authors report 3 series of studies on 44 normal young men under rigidly controlled conditions of diet, physical work and environment. The ascorbic acid intake was set at two levels: 20 to 40 mg and 520 to 540 mg. Particular attention was paid to (a) cardiovascular functions, (b) performance of standard physical tasks, (c) psychomotor functions and (d) ascorbic acid in sweat, blood plasma and urine. The performance of muscular work was studied in dry heat up to 122 F. The stay in the heat varied from three hours to four days. Comparisons were made between performances on a diet restricted in ascorbic acid intake and a diet supplemented by 500 mg of ascorbic acid daily. The dietary differences were maintained for periods of four to seven days. Pulse rates in rest and in work, rectal temperatures, vasomotor stability tests, rates of sweating, general observations and subjective reports all failed to demonstrate significant advantage for the men receiving supplements of ascorbic acid. Psychomotor tests and strength tests likewise failed to show any advantage in the ascorbic acid supplementation. There apparently was a slight gain in flicker fusion frequency related to the extra intake of vitamin C. Daily sweat losses were 5 to 8 liters, but the total loss of vitamin C in the sweat is negligible. Heat exhaustion occurred with equal frequency in the vitamin C restricted and supplemented groups.

American Review of Soviet Medicine, New York

1:485-588 (Aug) 1944

- Luzymes and Coenzymes Review of Biologic Catalysis J O Parnas —p 485
- Possible Relationship in Animals Between Tumor Susceptibility and Stability of Tissue Proteins V N Orekhovich —p 517
- Cancer of Stomach A A Bocharov —p 532
- *New Method of Treating Tetanus Lina S Stern —p 540
- High Frequency Electric Current in Treatment of Alcoholic Hallucinoses K A Gruenberg —p 544
- War Neuroses in Army and in Civilian Life T I Yudin —p 553

New Method of Treating Tetanus—Stern points out that the hematoencephalic barrier may prevent certain therapeutic substances from reaching the nerve centers. She proposed to treat tetanus by injecting the antitetanus serum into the cerebrospinal canal through a cisternal puncture. Precautions must be taken to force the solution under predetermined pressure into the ventricles by inserting the needle at a proper angle to prevent the fluid from flowing into the subarachnoid space. Injection of the serum into the subdural or subarachnoid spaces does not produce the desired effect, as the serum then returns to the blood stream without affecting the nerve centers. Animal experiments and veterinary practice demonstrate that when the symptoms of tetanus are manifest serum should be injected not only intramuscularly or intravenously but also into the ventricles by cisternal puncture. She usually injects 15,000 American units by cisternal puncture and from 30,000 to 50,000 American units intravenously or intramuscularly. This course may be repeated if necessary, but it is usually adequate. For the cisternal injection the patient is placed in a modified Trendelenburg position with the head somewhat lower than the body. At the moment of puncture the head is brought forward so that the chin rests on the sternum. The occipital protuberance and the spine of the atlas are palpated as landmarks. The needle is inserted at an acute angle between the two points and

directed inward in the midline. This point places the needle in the first cervical interspace. Resistance is felt at the dura. A relationship has been found to exist between the circumference of the patient's neck and the average depth of puncture. A neck circumference of 40 cm. corresponds to a puncture depth of 49 mm., a neck circumference of 39 cm. to a puncture depth of 47 mm., and so on. After from 10 to 20 cc. of cerebrospinal fluid has been withdrawn, an equal quantity of antitetanus serum warmed to body temperature is introduced. Six cases are described in which this method was used. As a rule, signs of lockjaw began to disappear twenty-four hours after cisternal injection of antitetanus serum. In cases of incipient tetanus a single cisternal injection of the serum was enough to control further development of the process, to effect a general improvement and to mitigate the symptoms of tetanus.

American Review of Tuberculosis, New York

50:85-184 (Aug.) 1944

- *Syphilis and Pulmonary Tuberculosis in Negro. R. Hoffman and G. G. Adams.—p. 85.
- *Nutrition in Tuberculosis as Evaluated by Blood Analysis. H. R. Getz, Irene S. Westfall and H. J. Henderson.—p. 96.
- Epidemiology of Reinoculation Tuberculosis: Epidemiologic Importance of Course of Bacilli and Route of Invasion in Reinoculation Types of Pulmonary Tuberculosis. F. M. Pottenger.—p. 112.
- Tuberculous Pneumonia. D. O. Shields.—p. 122.
- Recent Advances in Campaign Against Tuberculosis. R. G. Ferguson.—p. 131.
- Compulsory Hospitalization of Open Cases of Tuberculosis. A. L. Banyai and A. V. Cadden.—p. 136.
- Tuberculosis Rejectee. E. Bunta.—p. 147.
- Mediastinal Herniation in Artificial Pneumothorax: Case Report of Bilateral Mediastinal Herniation in Bilateral Pneumothorax and Herniation of Extreme Size and Unusual Type. I. D. Bobrowitz.—p. 150.
- Effect of Promin on Experimental Tuberculosis. A. R. Armstrong, M. V. Rae, C. C. Lucas and P. H. Greey.—p. 160.
- *Sulfanilamide, and Sulfapyridine in Experimental Tuberculosis. C. R. Smith.—p. 163.
- Bactericidal Action of Stilbestrol on Tubercle Bacilli. G. H. Faulkner.—p. 167.

Syphilis and Pulmonary Tuberculosis.—Hoffman and Adams report the results of serologic tests for syphilis on 1,705 tuberculous Negroes admitted consecutively to a sanatorium. There were 507 with positive serologic reactions, an incidence of 29.7 per cent of coexisting syphilis and tuberculosis. The bases for comparison were the amount of pulmonary involvement and the predominant type of tuberculous lesion on admission and the percentage of deaths occurring in both groups in relation to the admission classification. There was no significant difference in the amount of pulmonary disease, the predominant type of tuberculous lesion or the percentage of deaths in the negative and positive serologic groups. The difference in the percentage of syphilis between the minimal and the far advanced tuberculosis groups was less than 7 per cent and could not be used to infer that syphilis lowered the resistance to tuberculosis. The presence of syphilis does not alter the course of pulmonary tuberculosis. Before a tuberculous patient is subjected to antisyphilitic treatment his tuberculosis prognosis must be good. The presence of pregnancy and syphilitic contagiousness are the only exceptions. Proof that the use of an arsenical causes tuberculosis to flare up in any 1 case is extremely difficult, if not impossible. The use of fractional doses of arsenicals, because of fear that full doses may activate tuberculosis, is empirical and defeats the purpose of the antisyphilitic treatment. The authors gained the impression that tuberculosis is hardly ever the cause of a false positive reaction.

Nutrition in Tuberculosis as Evaluated by Blood Analysis.—Getz and his associates report the results* of a nutritional study of 457 tuberculous and nontuberculous patients attending an outpatient chest clinic. Each assay included a determination of blood hemoglobin, serum proteins, plasma carotene, serum calcium, serum phosphorus and serum phosphatase, as well as plasma ascorbic acid, vitamin A and erythrocyte sedimentation rate. The authors correlate the analyses with the presence or absence and character of tuberculosis and of the individual deficiencies with one another. The subjects were men between 20 and 45. Men with active pulmonary tuberculosis were deficient in ascorbic acid, vitamin A, hemoglobin and serum albumin in the order listed. All nutritional deficiencies were more extensive and profound in tuberculous than in nontuberculous sub-

jects. Subjects with far advanced tuberculosis were especially deficient in ascorbic acid, serum albumin, hemoglobin, vitamin A, carotene and serum calcium in the order listed. Nontuberculous men from the same population group were deficient in ascorbic acid, hemoglobin, vitamin A and serum albumin, but to a lesser degree. Persons with arrested tuberculosis had nutritive levels essentially the same as nontuberculous men. There was more active tuberculosis in the oldest age group (40 to 49) and less of it was in the minimal stage than was found in the younger age groups. Age and hemoglobin showed a negative correlation; the hemoglobin level remained constant as the age advanced. Tuberculous and nontuberculous subjects alike had normal plasma levels of carotene in the presence of abnormally low vitamin A levels, a fact indicating that carotene conversion was inadequate. The plasma ascorbic acid level showed a positive correlation with the erythrocyte sedimentation test when the maximum five minute drop was used, but no correlation was observed when the total sedimentation in one hour was used. The erythrocyte sedimentation rate showed a positive correlation with the serum albumin concentrations. This fact is believed to give the sedimentation test new significance.

Sulfanilamide and Sulfapyridine in Experimental Tuberculosis.—Smith reports observations on four groups of guinea pigs. He found that sulfanilamide causes complete inhibition of tubercle bacillus cultural growth at a dilution of 1:1,000; sulfapyridine causes some inhibition at 1:5,000, complete at 1:1,000. Guinea pigs treated with 340 mg. of drug divided into five daily doses showed blood levels of 10 to 30 mg. per hundred cubic centimeters falling off to lows of 1 to 5 mg. per hundred cubic centimeters during the night. Sulfanilamide levels rose more rapidly than those of sulfapyridine but were less well sustained at night. Following infection with tubercle bacilli, the sulfanilamide and sulfapyridine treated animals were slower in the development of allergy than the controls. There was distinctly less tuberculosis in the sulfanilamide and sulfapyridine treated animals than in the controls and less in the sulfapyridine treated than in the sulfanilamide treated animals. These differences were shown by fewer and smaller tubercles in the visceral organs, by less caseation in viscera and internal lymph nodes and by smaller spleens and smaller internal lymph nodes. The average arbitrary units of disease per animal were 9.6 for the controls, 6.5 for the sulfanilamide treated and 4.2 for the sulfapyridine treated group. The local lesions, on the other hand, including sites of inoculation and inguinal lymph nodes, were as large in the treated as in the control groups or larger.

Annals of Internal Medicine, Lancaster, Pa.

21:173-366 (Aug.) 1944

- *Glycosuria in Meningitis. F. Ferguson and D. Barr.—p. 173.
- Waterhouse-Friderichsen Syndrome: Observations on Associated Adrenal Insufficiency and Report of 4 Cases. S. W. Cosgriff.—p. 187.
- *Meningococcal Meningitis: Sulfadiazine Therapy (Review of 20 Cases). E. H. Grieco and A. M. Cove.—p. 194.
- Meningococcemia Without Meningitis: Study Made at Station Hospital, Fort George G. Meade, Maryland. H. W. Potter, R. D. Reid and L. H. Bornstein.—p. 200.
- Medical Problems in Middle East. C. F. Sams.—p. 215.
- *Heterophile Antibody Reaction in Infectious Mononucleosis. R. E. Kaufman.—p. 230.
- "Atypical" Coronary Disease in Young People. J. Weinstein.—p. 252.
- Syphilis and Diabetes Mellitus: Long Term Clinical Study. F. S. Perkin.—p. 272.
- Cirrhosis of Liver: Analysis of 71 Cases. I. D. Fagin and F. M. Thompson.—p. 285.
- Some Notes on Transmission of Heart Murmurs. S. A. Levine and W. B. Likoff.—p. 298.

Glycosuria in Meningitis.—Ferguson and Barr reviewed records of 72 patients with meningitis admitted to New York Hospital, 30 of whom showed glycosuria. Fourteen of the 30 had received infusions of dextrose solution at some time before the appearance of glycosuria. In the remaining 16 patients cause for the glycosuria other than the meningitis itself was not evident. Glycosuria was encountered in meningitis caused by the meningococcus, the pneumococcus, the staphylococcus, the tubercle bacillus and in 1 case in which the causative organism was not isolated. Glycosuria was accompanied in many instances by ketosis, hyperglycemia and diminished tolerance to sugar. Glycosuria was transient, disappeared in all cases and persisted beyond the third day in only 3 of the 16 cases. Coma with glycosuria and ketosis at the onset of meningitis may mask

the signs of meningeal involvement, lead to a diagnosis of diabetic acidosis and cause serious or fatal delay in instituting appropriate treatment for the meningitis.

Sulfadiazine in Meningococcic Meningitis—Grieco and Cove review the clinical features of 20 consecutive cases of meningococcic meningitis observed in the course of a year at the Station Hospital, Fort Totten, New York. The cases were sporadic. Sulfadiazine and its soluble sodium salt was the only sulfonamide utilized. Polivalent antimeningococcus serum was administered intravenously in 1 of the earliest cases in conjunction with chemotherapy. Such a severe reaction ensued that thereafter the use of serum was abandoned. As soon as the diagnosis was verified, an initial dose of 5 Gm of sodium sulfadiazine in 100 cc of distilled water was administered intravenously. Subsequent doses of 2 Gm were then given regularly every four hours for the next twenty-four hours either orally or intravenously, as determined by the patient's ability to ingest or retain the medication. Then 1 Gm doses were given every four hours until the temperature returned to normal, and from this point on four times daily for the next seven days. With this medication, adequate blood concentrations were attained and satisfactory clinical responses resulted. The Waterhouse-Friderichsen syndrome was diagnosed clinically in 1 case. The use of adrenal cortex extract was a life saving measure in this instance. This survival on substitutional therapy augurs well for this much dreaded complication. Two deaths resulted in this series of 20 cases. One occurred within less than twelve hours after the onset of the disease, the other four days after admission. Necropsy in the latter revealed a severe bilateral hemorrhagic necrosis of the adrenals.

Heterophile Antibody Reaction in Infectious Mononucleosis—The present concept is that there are three types of sheep cell agglutinins: those in normal serum absorbed by guinea pig kidney but not by beef erythrocytes, those in the serum of patients with infectious mononucleosis absorbed by beef erythrocytes but not by guinea pig kidney and those in the serum of persons treated with horse serum absorbed by both guinea pig kidney and beef erythrocytes. In this country the Paul Bunnell and Davidsohn methods are standard procedures. Kaufman describes changes made in the Davidsohn technique, the net result of which is that the test is simplified, is just as accurate and gives considerably quicker results. Telephoned reports can be given within one hour of the time of arrival of the serum in the laboratory, if speed of diagnosis is important, which it occasionally is in a questionable case of infectious mononucleosis thought to be acute appendicitis, meningitis, typhoid, mumps or diphtheria. So much time is saved by these modifications in technique that many more specimens can be examined in a day. During a three year period 83 proved cases of infectious mononucleosis have been investigated. In the diagnosis of this disease there are three aspects to consider: the clinical, the hematologic and the serologic. It is felt that if any two of them are definite the diagnosis may be considered established. Tests were performed in 78 of 83 cases of infectious mononucleosis. It is believed that agglutination in a dilution of 1:28 with the correct differential absorption tests is a positive reaction. A positive test supports the diagnosis of infectious mononucleosis, but a negative test does not rule it out. The reaction may become positive as early as the third day but sometimes not until the second month or not at all. The reaction usually remains positive for two to four months.

Archives of Physical Therapy, Chicago

25:455-506 (Aug.) 1944

- Future Development of Physical Medicine. G. M. Pieroni—p. 455.
- Treatment of Bronchial Asthma by Intensive Breathing Therapy. H. I. Weiser—p. 461.
- Rehabilitation of Convalescent Industrial Civilities with Physical Medicine. H. D. Storms—p. 469.
- Fluorescence Test for Real and Apparent Death in Warfare. J. De Ment—p. 472.
- Army Rehabilitation Program for Blind and Deafened. C. C. Hillman—p. 475.
- Trench Foot. R. C. Berson and R. I. Anglueter—p. 487.

Breathing Therapy in Bronchial Asthma—Weiser treated asthmatic patients who had failed to respond to other treatments by breathing therapy. His intensified breathing therapy consists of massage, rhythmic compressions of the

thorax and breathing exercises. Intensive gymnastics are of special importance. These include sports (boxing, jujitsu, calisthenics) associated with regulated breathing. The exercises must be performed daily over a period of months or even years. Dyspnea is produced by physical strain during each treatment but with the aid of the acquired technique of respiration it is soon breathed away. The patient learns how to master dyspnea by concentration and regulation of respiration. Courage training, boxing, apparatus gymnastics and increased efforts during the course of treatments increase self confidence in the asthmatic patient. Intensified breathing therapy should be supervised by the physician. The vital capacity, expiration time and breathing span were always considerably increased during the course of treatments. The absolute value for vital capacity cannot be taken as a criterion for a prognosis. Prognostic conclusions can be drawn from curves derived from the vital capacity and expiration time measured during each treatment. In the study reported the minimum time of observation after treatment was twelve months. It was possible to keep 13 among 39 juvenile asthmatic patients free from attacks; they were under observation for three and one-half years. The disease in 10 of these 13 had lasted for more than two years before the treatment was instituted. Ten of the 29 children continued to show improvement. Six remained unimproved. Of 10 asthmatic adults, 1 was freed of attacks, 5 improved and 4 were not affected.

Archives of Surgery, Chicago

49:1-74 (July) 1944

- Early Ambulation Following Section of Anterior Abdominal Wall. Analysis of 426 Personally Conducted Cases. H. Nelson—p. 1.
- Cystic Tumor of Iliopsoas Bursa. Report of 2 Cases. V. R. Stephens—p. 9.
- Clinical Observations on Tissue Temperatures. Pathologic and Therapeutic Effects. F. K. Safford Jr. and M. B. Nathanson—p. 12.
- Effect of Experimental Fracture on Bone, Dentin and Enamel. Study of Mandible and Incisor in Rat. B. G. Sarnat and I. Schour—p. 23.
- Peritoneal Tap. L. R. Kaufman, W. P. Eckes and J. Mule—p. 39.
- Alkaline and Acid Phosphatase Levels in Serum of Dogs After Ligation of Common Bile Duct. J. L. Carr and F. S. Foote—p. 44.
- Local Implantation of Gelatin in Wounds. J. A. Sinclair and B. Douglas—p. 47.
- Cavernous Hemangioma of Lung (Arteriovenous Fistula). Report of Case with Successful Treatment by Pneumonectomy. W. E. Adams, T. L. Thornton Jr. and Lillian Fichelberger—p. 51.
- Review of Urologic Surgery. A. J. Scholl, F. Hinman, A. von Fichtenberg, A. B. Hepler, R. Gutierrez, G. J. Thompson, E. A. Cook, E. Wildholz and V. J. O'Connor—p. 59.

Early Ambulation Following Abdominal Section—Nelson reports observations on 426 personally conducted cases. As soon as the patient has fully recovered from the effects of anesthesia, the bed is sharply tilted, so that the head is elevated. After this position has been maintained for a time the bed is leveled and the patient assumes a sitting position on the side of the bed, with the feet resting on a chair. In this position he breathes deeply and coughs frequently. He then lies down, and the head of the bed is again sharply elevated. After a second period of rest he is assisted to stand and is conducted to the bathroom, where the bladder is practically always emptied without difficulty. If his condition is good he sits up in a chair for a time before returning to bed. Those who are oversensitive to the pain of the first rising or who are unduly apprehensive are made to practice sitting at the edge of the bed with intervals of rest after each attempt, until they are strong enough and willing to walk to the bathroom. The majority of patients walked on the day of operation or within the first twenty-four hours. The incidence of immediate and delayed complications in this series was minimal. Of the three partial disruptions of a wound two occurred in patients whose wounds had been closed with catgut and for whom early ambulation had not been authorized. Only two incisional hernias were observed. The single fatality in the series was due to cerebral thrombosis. Good results depend on the strict observance of contraindications as well as of indications. Contraindications to early ambulation are: 1. Failure to observe the prerequisites of optimum healing of wound including failure to carry out the tenets of Halsted as to the closure of a wound, the use of suture materials other than wire or cotton and the existence of deficiencies of vitamins and hypoproteinemia. 2. Conditions such as shock, peritonitis, active hemorrhage, cardiac failure, pneumonia and impending

or actual thyroid crisis 3 Potential or actual complications including gross contamination, infection, hemorrhage and dehiscence 4 Pregnancy in which abortion is feared 5 Extreme debility, for which ambulation is deferred until there is some restoration of strength and muscle tone, as a result of sitting up 6 Second stage of a thoracolumbar sympathectomy, after which the patient, because of sudden alterations in the vascular system, cannot immediately tolerate the upright position 7 Lack of adequate and intelligent nursing supervision The advantages of early ambulation include the lowered incidence of postoperative complications, particularly pulmonary and vascular complications, the lower incidence of nausea, vomiting and abdominal distention, the earlier return of normal function of the bladder and the bowel, the maintenance of normal muscle tone, the psychologic effect on the patient's morale and mental status, the acceleration of convalescence and the earlier return of working ability, and the economic savings to the patient and the hospital

Peritoneal Tap—Kaufman and his associates say that their interest in peritoneal tap was stimulated when they began an exhaustive study of perforation of peptic ulcers in an effort to reach an early diagnosis by administering methylene blue by mouth and recovering the dye by peritoneal puncture Peritoneal tap is performed with a number 18 or 19 gage needle $2\frac{1}{2}$ inches long through a small procaine hydrochloride wheal in the midline below the navel or to either side or in the epigastrium Peritoneal tap is a practical and safe procedure which requires extreme care in removal of the peritoneal contents and study of the smears and which affords evidence of the peritoneal reaction present by a simple and rapid laboratory study In children the procedure serves to differentiate streptococci and pneumococci peritonitis from appendicitis While a positive result of a tap is of diagnostic value, a negative result should be disregarded, especially in the face of other diagnostic signs, a negative result indicates usually only failure to obtain fluid which is present Peritoneal tap should be reserved for selected cases presenting confusion in diagnosis, and the interpretation of the smear must be painstaking In cases in which perforated peptic ulcer is suspected, when diagnostic data are confusing and likely to lead to exploratory laparotomy, the recovery by peritoneal tap of methylene blue previously introduced into the stomach will establish the exact diagnosis While the results of the procedure were of definite clinical value in only 14 of their 22 cases, the diagnosis in all of these presented great difficulties and could be established accurately only by exploratory laparotomy The tap in these cases established data that determined diagnosis and aided definitely in treatment as well as in evaluation of prognosis

Cavernous Hemangioma of Lung—Adams and his associates stress the rarity of hemangioma of the lung, pointing out that the case reported by them was the first in more than 240,000 admissions at the University of Chicago Clinics in the last fifteen years, and more than 4,380 necropsies at the same institution did not reveal another such lesion A man aged 24 entered the University Clinics complaining of frequent nosebleeds and colds over the last two or three years He also had suffered from generalized cyanosis and clubbing of the fingers and toes for at least sixteen years A roentgenogram of the chest revealed a large, irregularly shaped circumscribed opacity in the left lung and a small one in the right lung There were associated compensatory polycythaemia polycythemia and hyperhemoglobinemia After removal of the left lung the status of the blood approached the normal and the patient returned to work Most investigators who have reported cases similar to the 1 presented here have described the lesion as a cavernous hemangioma A careful study of the microscopic sections made from the specimen removed from their patient revealed only normal pulmonary tissue surrounding the three separate mesothelium lined cavities found in the left lung On the basis of the pathologic picture the lesions are really arteriovenous aneurysms or fistulas The pulmonary lesion produced a great compensatory change in the quality and the quantity of the blood Polycythemia (7200,000 cells) was present before operation with cythemia (7200,000 cells) was present before operation with a corresponding increase in red cell mass (hematocrit reading 82 per cent) and hemoglobin (23 Gm per hundred cubic centimeters) The blood volume was approximately two times the

normal amount, the increase being entirely in the red cell mass After the removal of the left lung, all of the blood was diverted to the right side and was aerated as it passed through the right lung The red cell count fell more than 2,000,000 within two days and has remained at a high normal level The hemoglobin content was reduced from a preoperative level of 23.0 Gm to the present level of 15.7 Gm per hundred cubic centimeters The hematocrit reading was likewise reduced from 82 to 54 per cent The estimated total blood volume fell from 12,750 cc (preoperative) to 6,900 cc by the second postoperative day, this reduction being entirely in the erythrocytes Ten days later the blood volume was 6,350 cc, a value which is approximately normal Although only 4 similar cases have been previously reported, the condition in others has probably gone undiagnosed and been treated as polycythemia vera When clubbing of the fingers and the toes is present, some pulmonary lesion should be suspected and a roentgen examination of the lungs made A correct diagnosis may be readily established on the basis of altered values of blood oxygen and the finding of an opacity in the lung on roentgen examination

Bulletin of Johns Hopkins Hospital, Baltimore

74:321-426 (June) 1944

- Effect of Testosterone Propionate on Arterial Blood Pressure Kidneys Urinary Bladder and Ivers of Growing Dogs S S Blackman Jr., Caroline Bedell Thomas and J E Howard—p 321
- Experimental Hypertension from Section of Moderator Nerves Relationship of Acute Pressor Response to Development and Course of Chronic Hypertension Caroline Bedell Thomas—p 335
- *On Isolation and Properties of Fluorescent Factor F⁺ from Human Urine V A Najjar Virginia White and D B McScott—p 378
- Laboratory Diagnosis of Nicotinic Acid Deficiency An Improved Procedure for Determination of F⁺ (N Methyl Nicotinamide Derivative) in Urine V A Najjar—p 392
- *Case of Pellagra Developing on Hospital Ward in Patient Receiving Vitamin B Complex D W Roberts and V A Najjar—p 400
- Antitongue Activity of N Methyl Nicotinamide Chloride V A Najjar, Margaret M Hammond, Mary Allen English, Maria B Wooden and Carolyn C Deal—p 406

Fluorescent Factor F⁺ in Human Urine—Najjar and Wood described in 1940 the presence in urine of a substance with a characteristic bluish fluorescence the excretion of which was related to the availability of nicotinic acid, being increased in proportion to the nicotinic acid intake This substance, designated as F⁺, was regularly absent from the urine of patients with pellagra In this paper Najjar and his associates show that the highly fluorescent compound F⁺ obtained on treating urinary eluates with alkali and butanol is apparently derived from a precursor which shows only a slight bluish fluorescence The procedure used—alkalization and butanol extraction—serves to convert this precursor into the highly fluorescent compound F⁺ The identity of the urinary precursor is not yet completely established The highly fluorescent substance F⁺, formed from the urinary precursor, appears to be a butyl ether of N-methyl nicotinamide alphacarbinol

Pellagra Developing in Hospital Patients Receiving Vitamin B Complex—Roberts and Najjar report the history of a girl aged 12 Between August 1942 and April 1943 the patient's weight decreased from 78 pounds (35 Kg) to 60 pounds (27 Kg) The most conspicuous symptom during this period was anorexia Although offered a liberal diet containing cereal, eggs, bacon, green vegetables, meat, potatoes and a quart of milk daily, only small amounts of the quantity offered were taken The patient was frequently nauseated and at times vomited after meals Following admission to the hospital in April 1943 the patient continued a downward course Therapy consisted in a high caloric diet supplemented with orange juice and a liquid extract of yeast, given in doses of 4 cc per day, to furnish the B complex The hemoglobin fell to 8 Gm but responded well to a transfusion In spite of the supportive measures the patient continued to lose weight gradually Eight weeks after admission it was noticed that a symmetrical brown pigmentation had developed on the backs of the hands extending up to the knuckles, where it was sharply demarcated from the pale skin beyond Brown pigmented areas were likewise noted over the calluses of the elbows The suspicion of pellagra was borne out by the tongue, which was red, notably at the margins, and showed atrophy of the papillae The diagnosis was confirmed by studies of the excretion of the fluorescent

factor F₂ (N-methyl nicotinamide derivative) in the urine. Some light on the pathogenesis of the pellagra was obtained from a consideration of the vitamin content of the yeast extract which had been used in treating the patient. It was found that the daily dose which the patient had been getting contained 0.3 mg. of thiamine and 10 mg. of riboflavin but only insignificant amounts of nicotinic acid. The authors suggest that an obscure intestinal disorder, perhaps of the nature of a regional ileitis, interfered with intestinal absorption to an extent sufficient to cause pellagra. It is pointed out that certain commercial yeast extracts do not supply sufficient quantities of nicotinic acid.

Bulletin New York Academy of Medicine, New York
20:427-470 (Aug.) 1944

*Jaundice Following Administration of Human Serum: Harvey Lecture, March 16, 1944. J. W. Oliphant.—p. 429.
Major Therapeutic Trends in American Psychiatry. J. C. Whitehorn.—p. 446.
Shoulder Pain and Disability. D. M. Bosworth.—p. 460.

Jaundice Following Administration of Human Serum.—Oliphant shows that jaundice following administration of materials containing serum of the homologous species has been observed repeatedly both in man and in the lower animals. It is still unknown whether this type of jaundice is identical with naturally occurring so-called infectious hepatitis. The author presents the results of a sample survey of an epidemic of jaundice occurring subsequent to vaccination against yellow fever in the Virgin Islands in 1942. Jaundice was produced experimentally (1) by the inoculation of two lots of yellow fever vaccine containing human serum, (2) by the inoculation of small amounts of filtered serum from each of 3 persons and of a serum pool from 9 persons all of whom had previously received yellow fever vaccine containing human serum and (3) by inoculation of serum from 1 person who had early spontaneously occurring jaundice. Two serums which were icterogenic when inoculated subcutaneously failed to produce jaundice by the intranasal route. Persons of all four Moss blood groups and both Rh positive and Rh negative persons were found to be susceptible. Susceptible persons did not give uniform local skin reactions to icterogenic serums. The jaundice producing agent is filtrable and survives drying in vacuum, storage for long periods in serum at 4 C. and heating to 56 C. for one-half hour in the dried state. The agent was found to be present in the blood during the prejaundice period but not two and one-half months after the disappearance of jaundice. The icterogenic agent is apparently inactivated by short exposure to ultraviolet irradiation. Transmission of jaundice by ordinary contact apparently did not occur during this experiment. Attempts to produce jaundice in experimental animals were unsuccessful. Antigens prepared from human livers and from chick embryos failed to fix complement in the presence of serums obtained after recovery from jaundice.

Bull. of the U. S. Army Med. Dept., Washington, D. C.
79:1-122 (Aug.) 1944

Anesthesia in Combat Zone. G. Shortz.—p. 60.
Cutaneous Leishmaniasis. D. Ball and R. C. Ryan.—p. 65.
Oral Rehabilitation: Case Report. R. C. Reichert.—p. 74.
Herniated Nucleus Pulposus: Improvement in the Operative Technique. R. C. L. Robertson and W. G. Peacher.—p. 76.
Surgical Problems in Buna Campaign. A. Thorndike.—p. 77.
Vaccinia Occurring at Short Intervals. C. A. Munning.—p. 82.
Inspection of Fish of Pacific Northwest. E. W. Bloomquist.—p. 84.
Diagnosis of Dengue. G. V. LeRoy and H. A. Lindberg.—p. 92.
*Experimental Use of Penicillin in Treatment of Sulfonamide Resistant Gonorrhea. R. J. Murphy.—p. 101.
Modified Orthopedic Table Constructed in Field. V. Mayer.—p. 105.
Psychoses in Army: Follow-Up Study. N. Q. Brill and E. F. Walker.—p. 108.

Penicillin in Sulfonamide Resistant Gonorrhea.—Murphy treated 306 cases of sulfonamide resistant gonorrhea with penicillin. Of this number 262 cases were cured following the first trial on penicillin. Thirty-four failures following the first treatment were treated again according to another schedule, with recovery in all but 3. These 3 were treated again and now responded. The treatment consisted of a total of 100,000 units given over a twelve hour period in five doses of 20,000 units.

The foremost clinical observation was the persistence of urethritis following treatment. The character of the discharge changed from a purulent to a thin watery one. The mucous membrane of the urethra remained inflamed, glistening and moist beyond the time of disappearance of the watery discharge. In the majority of cases it was about one week after treatment before all evidence of the infection disappeared. In spite of the persistence of discharge and inflammation, all subjective symptoms such as dysuria, polyuria, hematuria and nocturia usually had subsided by the time the last treatment had been administered. The urine, after becoming clear, retained shreds in the majority of cases throughout the entire follow-up period. Only 1 patient had a generalized urticaria five days following treatment, which persisted for three days. Gonorrheal conjunctivitis is cured by the intramuscular administration of penicillin. Acute suppurative prostatitis responds slowly but favorably. Four cases of gonorrheal arthritis with concomitant gonorrheal urethritis showed no benefit from penicillin and in every case following the cure of the urethritis other treatments for the arthritis were required.

Canadian Medical Association Journal, Montreal
51:99-194 (Aug.) 1944

Social Implications of Scientific Research. J. R. Williams.—p. 99.
*Further Studies on Relationship of Corneal Vascularization to Riboflavin Deficiency. J. F. McCreary, J. V. V. Nicholls and F. F. Tisdall.—p. 106.
*Closed Plaster Method in Prevention of Shock After Burns. E. A. Sellers and E. S. Goranson.—p. 111.
Wartime Pressures. D. E. Cameron.—p. 114.
Epidemic Jaundice. A. Somerville and J. S. Clark.—p. 120.
Problem of Nasal Medication, with Particular Reference to Privine HCl 0.1 per Cent. J. Gollom.—p. 123.
Vertigo. J. P. Boley.—p. 126.
Condyloma Acuminata or Genital Warts in Female (Report of Case). H. Dover.—p. 132.
Medical Education: Interns and Residents. J. C. Mackenzie.—p. 134.
Typhoid Epidemic in Southern Alberta. F. W. Gershaw.—p. 138.
Tuberculosis Concepts Then and Now. D. F. McRae.—p. 139.
First Aid and Transportation in Cases of Fracture or Suspected Fracture of Spine. G. P. Howlett.—p. 142.
Procedures Recommended for Organization and Operation of Blood Bank: Part II. Procedures. L. J. Rhea, O. F. Denstedt, A. Bertrand, G. J. E. van Dorsser and P. H. Greey.—p. 144.

Corneal Vascularization and Riboflavin.—McCreary and his associates report studies to determine whether or not a slit lamp examination and the photographic procedure give comparable data and to throw further light on the effect of riboflavin on corneal vascularization and symptoms of eye fatigue. The results obtained from photographing the corneoscleral junction with the ophthalmic camera and by an examination with a slit lamp are not significantly different. A study to demonstrate the effect of riboflavin on corneal vascularization has been carried out, using both photography and the slit lamp examination. The subjects studied were 41 students in the photographic division of the Canadian Air Force who had been provided with a ration containing when served 2.9 mg. of riboflavin per day for a period of one year. Approximately one half of the subjects were given a supplement of 3.3 mg. of riboflavin three times a day for two months and the others received placebos. There was no consistent change in corneal vascularization in either the treated subjects or the controls. The instillation of a simple irritant in the conjunctival sac caused collapsed, afunctional blood vessels in the cornea, transitional zone and conjunctiva to become engorged. As far as this study shows, it seems that a uniform peripheral corneal vascularization is not a safe basis for a diagnosis of riboflavin deficiency existing at the time of examination. Such a lesion may be due to riboflavin deficiency, but the deficiency could have occurred at any time previous to the examination. Also these blood vessels could have been reactivated by some cause other than lack of riboflavin.

Closed Plaster Method in Prevention of Shock.—According to Sellers and Goranson mortality from shock was greatly reduced when plastering was carried out immediately after the burn. They report a series of experiments designed to show whether any benefit in this respect can be derived from later application of plaster or from "pressure" dressings. It was found that immediate application of plaster bandages

decreases the mortality rate and hemoconcentration to a great degree. Some benefit in this respect accrues from application within one hour. Immediate application of plaster is more effective in decreasing the mortality rate from shock than is the immediate application of pressure dressings. As these experiments were performed with animals and under laboratory conditions, conclusions drawn from them should be accepted with reservations as to direct clinical application.

Georgia Medical Association Journal, Atlanta

33:201-236 (July) 1944

Hypertension: Examination of Patients. H. M. Davison, H. Bowcock and E. Vogt.—p. 201.

Medical Conservation of Manpower in Shipyard. R. L. Brown.—p. 208.

Georgia's Postwar Public Health Program. T. F. Abercrombie.—p. 213.

33:237-264 (Aug.) 1944

Ulcers of Stomach and Duodenum. A. W. Allen.—p. 237.

Penicillin in Acute and Chronic Infections. A. L. Evans.—p. 249.

Psychoanalysis: Christ versus Freud. E. S. Osborne.—p. 251.

Journal of Clin. Endocrinology, Springfield, Ill.

4:229-286 (June) 1944

*Thiouracil Treatment in Hyperthyroidism. E. B. Astwood.—p. 229.

*Treatment of 26 Thyrotoxic Patients with Thiouracil and Review of Toxic Reactions in All (135) Reported Cases. T. H. McGavack, A. J. Gerl, Mildred Vogel and D. Schwimmer.—p. 249.

Human Pregnancy Test Based on Color Reaction of Pregnanediol in Urine. H. S. Guterman.—p. 262.

Protein Bound Plasma Iodine in Patients with Thyroid Disease: I. Correlation with Basal Heat Production. B. E. Lowenstein, M. Bruger and J. W. Hinton, with technical assistance of S. Member.—p. 268.

Case of Probable Pan-Hypopituitarism Following Postpartum Pituitary Necrosis. S. J. Glass.—p. 273.

Thiouracil Treatment in Hyperthyroidism.—Astwood reviews observations on 62 persons who have been given repeated doses of thiouracil. Eleven had normal thyroids, while 51 had hyperthyroidism. Large nodular goiters were not common. Forty-one of the 51 cases were considered to be diffuse hyperplastic goiter with hyperthyroidism. In 8 of these iodine had been given shortly before thiouracil. The administration of 0.2 to 0.6 Gm. of thiouracil daily in two doses quickly controlled all the manifestations of hyperthyroidism in previously untreated cases. The metabolic response was slower in most cases of toxic nodular goiter, in iodine treated diffuse hyperplastic goiter with hyperthyroidism and in normal persons. A temporary enlargement and increased vascularity of the thyroid gland was noted in some cases. Exophthalmos usually improved slowly. Iodine still exhibited its characteristic effect on patients both during and after thiouracil therapy. Serious side-effects consisting of granulocytopenia and drug fever occurred in about 10 per cent of the cases during the early weeks of therapy. Adequate treatment, continued for longer than six months, was attended by a high incidence of lasting remissions.

Thiouracil in Thyrotoxic Patients.—McGavack and his associates observed 4 male and 22 female patients while under treatment with thiouracil. Fourteen of the patients were hospitalized, while the other 12 made no change in their usual routine of living. The patients were followed for periods ranging from six days to nine months. Characteristic effects in the adequately treated patient included a lowering of the basal metabolic rate, a decrease in pulse rate, a narrowing of the pulse pressure with diminution in the systolic figure, an increase in weight and an elevation of the value for total blood cholesterol. The size of the thyroid was moderately decreased under treatment with thiouracil, and creatinuria was diminished. No variations in blood chlorides, sodium or potassium were observed. Tests of liver function failed to show abnormality before or during treatment. A table lists the incidence of toxic reactions in 109 cases in which thiouracil had been given which had been previously reported by others and in the 26 here presented. In the total of 135 cases studied to date there were 16 (11.5 per cent) that exhibited a toxic or hypersensitivity reaction. Two of the 26 exhibited a toxic or hypersensitivity reaction. One developed agranulocytosis, the other a fever and widespread urticarial rash. The authors think that results of therapy with thiouracil have been sufficiently promising to warrant its extended and prolonged use in cases of toxic hyperplasia with a view to avoiding opera-

tive procedure. However, in this connection the toxic action must ever be kept in mind, and the clinician must be prepared to change his course when faced with early signs of unfavorable reaction.

Journal of Clinical Investigation, Boston

23:417-606 (July) 1944. Partial Index

Chemical, Clinical and Immunologic Studies on Products of Human Plasma Fractionation: I. Characterization of Protein Fractions of Human Plasma. E. J. Cohn, J. L. Oncley, L. E. Strong, W. L. Hughes Jr. and S. H. Armstrong Jr.—p. 417.

Id.: II. Electrophoretic and Ultracentrifugal Studies of Solutions of Human Serum Albumin and Immune Serum Globulins. J. W. Williams, Mary L. Petermann, G. C. Colvoss, Martha B. Goodloe, J. L. Oncley and S. H. Armstrong Jr.—p. 433.

Id.: III. Amino Acid Composition of Plasma Proteins. E. Brand, Beatrice Kassell and L. J. Sidel.—p. 437.

Id.: IV. Study of Thermal Stability of Human Serum Albumin. G. Scatchard, S. T. Gibson, L. M. Woodruff, A. C. Batchelder and A. Brown.—p. 445.

Id.: V. Influence of Nonpolar Anions on Thermal Stability of Serum Albumin. G. A. Ballou, P. D. Boyer, J. M. Luck and F. G. Lum.—p. 454.

Id.: VII. Concentrated Human Serum Albumin. C. A. Janeway, S. T. Gibson, L. M. Woodruff, J. T. Heyl, O. T. Bailey and L. R. Newhouser.—p. 465.

Id.: VIII. Clinical Use of Concentrated Human Serum Albumin in Shock and Comparison with Whole Blood and with Rapid Saline Infusion. A. Cournand, R. P. Noble, E. S. Breed, H. D. Lauson, E. deF. Baldwin, G. B. Pinchot and D. W. Richards Jr.—p. 491.

Id.: IX. Treatment of Shock with Concentrated Human Serum Albumin; Preliminary Report. J. V. Warren, E. A. Stead Jr., A. J. Merrill and E. S. Brannon.—p. 506.

Id.: X. Concentrations of Certain Antibodies in Globulin Fractions Derived from Human Blood Plasma. J. F. Enders.—p. 510.

Id.: XI. Use of Concentrated Normal Human Serum Gamma Globulin (Human Immune Serum Globulin) in Prophylaxis and Treatment of Measles. J. Stokes Jr., E. P. Maris and S. S. Gellis.—p. 531.

Id.: XIV. Appraisal of Isohemagglutinin Activity. E. L. DeGowin.—p. 554.

Id.: XVI. Fibrin Clots, Fibrin Films and Fibrinogen Plastics. J. D. Ferry and P. R. Morrison.—p. 566.

*Id.: XVII. Fibrinogen Coagulum as Aid in Operative Removal of Renal Calculi. J. E. Dees.—p. 576.

*Id.: XIX. Note on Use of Fibrinogen and Thrombin in Surface Treatment of Burns. C. v. Z. Hawn, E. A. Bering Jr., O. T. Bailey and S. H. Armstrong Jr.—p. 580.

Id.: XX. Development of Fibrin Foam as Hemostatic Agent and for Use in Conjunction with Human Thrombin. E. A. Bering Jr.—p. 586.

Id.: XXII. Fibrin Films in Neurosurgery, with Special Reference to Their Use in Repair of Dural Defects and in Prevention of Meningo-cerebral Adhesions. O. T. Bailey and F. D. Ingraham.—p. 597.

Id.: XXIII. Effects of Feeding Possible Blood Substitutes on Serum Protein Regeneration and Weight Recovery in Hypoproteinemic Rat. P. R. Cannon, Eleanor M. Humphreys, R. W. Wissler and L. E. Frazier.—p. 601.

Fibrinogen Coagulum in Removal of Renal Calculi.

Dees describes a new aid in the removal of small free stones from the renal pelvis at open operation. By the simultaneous injection of solutions of fibrinogen and thrombin, a strong coagulum which completely fills the pelvis and enmeshes all free stones is produced. On withdrawing this coagulum through the usual pyelotomy incision, all free stones should be removed. Fragmentation of calculi and trauma to the kidney are thus avoided. This operative procedure has been carried out on 21 patients without demonstrable ill effect.

Fibrinogen and Thrombin in Surface Treatment of Burns.

Hawn and his associates point out that, when large quantities of purified human fibrinogen and thrombin became available through the fractionation of human plasma to prepare albumin for the armed forces, studies were undertaken to develop from these proteins, which constitute important components in the natural mechanism for the protection of wounds, a dressing which would meet the specifications for an agent for the surface therapy of burns. They present observations on surgically denuded areas of animals and burns on human beings which suggest that human fibrinogen and thrombin mixtures have no deleterious effect on normal processes of repair. The use of preformed fibrin films prepared from the proteins involved in the natural coagulation mechanism is described in a small series of second and third degree burns. Such films are susceptible of adaptation to many programs of surface therapy. It is suggested that such films, particularly in the form of roll bandages, might prove a highly expedient fibrinogen-thrombin dressing for burns in the field, owing to simplicity and speed from the standpoint of application and to lack of bulk from the standpoint of transportation.

Journal of Lab. and Clinical Medicine, St. Louis

29:785-888 (Aug.) 1944

- *Clinical Use of Phthalylsulfathiazole. E. J. Poth and C. A. Ross.—p. 785.
- Acute Toxicity of Commercial Penicillin. H. Welch, C. W. Price, J. K. Nielsen and A. C. Hunter.—p. 809.
- Actinomycosis: Report of Case with Military Chest Lesions. A. M. Harris and J. B. Priestley.—p. 815.
- Local Eosinophilia in Malignant Neoplasms. A. J. Gill.—p. 820.
- Subacute Bacterial Endocarditis Confined to Pulmonic Valve with Malformed Leaflets. R. J. Rogers.—p. 825.
- Note on Possible Allergic Factor in Altitude Sickness. Julia Baker.—p. 831.
- Effect of Heparin on Phagocytosis: Observations on *P. Lophurae* in Chick. R. H. Rigdon.—p. 840.
- Effect of Gonads and Adrenals on Absorption of Subcutaneous Sesame Oil. C. E. Tobin.—p. 850.
- Effect of Bile Acids on Biliary Excretion of Neoparsphenamine and Mapharsen. J. H. Annegers, F. E. Snapp, A. C. Ivy and A. J. Atkinson.—p. 853.

Clinical Use of Phthalylsulfathiazole.—Poth and Ross say that an extensive study covering twenty acylated sulfonamides in an attempt to find substances possessing antibacterial properties and being poorly absorbed from the alimentary tract has resulted in the synthesis and discovery of several compounds fulfilling these specifications. They report experiences with phthalylsulfathiazole, a condensation product of sulfathiazole and phthalic anhydride. It is an antibacterial agent of considerable interest and of therapeutic possibilities when activity restricted to the alimentary tract is desired. Approximately 5 per cent of the orally administered therapeutic dose is excreted in the urine. Ordinarily the concentration of the drug in the blood does not exceed 1.5 mg. per hundred cubic centimeters. As compared to their respective bacteriostatic activities, when measured by their ability to suppress the coliform organisms, phthalylsulfathiazole possesses roughly twice the activity of succinylsulfathiazole. In the absence of diarrhea and ulcerated lesions in the bowel a single daily dose of phthalylsulfathiazole will effectively lower the coliform organisms in the feces. The vegetative forms of *Clostridia* are greatly reduced following the oral administration of phthalylsulfathiazole, and stools are rendered odorless without ordinarily producing a diarrhea. The drug is likewise an effective bacteriostatic agent locally in the bowel, as is indicated by the alteration of the coliform bacteria in the presence of a watery diarrhea. An extensive study of absorption and excretion has shown that an average of 5 per cent of the oral therapeutic dose of phthalylsulfathiazole is excreted in the urine. Analyses of stools reveal that the content of phthalylsulfathiazole and a "free" diazotizable degradation product chemically similar to sulfathiazole varies between wide limits and that this "free" compound may maintain a concentration of 1,250 mg. per hundred grams. The authors describe preliminary trials of phthalylsulfathiazole in nonspecific diarrheas, bacillary dysentery, chronic ulcerative colitis and for the preoperative preparation of the large bowel. The drug appears particularly well tolerated by patients having ulcerative colitis and is quite effective in inducing and maintaining prolonged remissions. Severe toxic manifestations have not been encountered in patients with ulcerative colitis even though the therapy has continued for several months. Phthalylsulfathiazole can be maintained in high concentration in the diseased alimentary tract with low concentrations in the blood. It is suggested that the action of succinylsulfathiazole and phthalylsulfathiazole may not be due either wholly or in part to the formation of sulfathiazole by simple hydrolysis. As indicated by the alteration of the coliform flora in the bowel of man, phthalylsulfathiazole in half the dosage is as effective as succinylsulfathiazole.

Journal of the Mount Sinai Hospital, New York

11:63-136 (July-Aug.) 1944

- William Henry Welch Lectures: II, Restoration and Pathologic Reactions of Liver. F. C. Mann.—p. 63.
- Newer Advances in Knowledge of Gastritis. B. B. Crohn.—p. 75.
- Essays on Biology of Disease. E. Moschowitz.—p. 83.
- Massive Pulmonary Embolism: II, Based in Part on Study of 88 Fatal Cases. H. Neuhof and S. H. Klein.—p. 87.
- Life's Later Years: Studies in Medical History of Old Age. F. D. Zeman.—p. 97.
- Intracranial Meningiomas. A. T. Kazan, D. Weller and J. Gomez Jaramillo.—p. 105.

Journal of Oral Surgery, Chicago

2:193-288 (July) 1944

- Development of Treatment of Jaw Fractures. L. L. Schwartz.—p. 193.
- Soft Tissue Surgery. B. E. Luck.—p. 222.
- Cleft Palate. J. W. Kemper.—p. 227.
- Osteotomy for Correction of Mandibular Malrelation of Developmental Origin. R. O. Dingman.—p. 239.
- Plastic Operation for Lengthening Congenitally Short Upper Lip: Preliminary Report. J. F. Ford.—p. 260.
- *Monocytic Leukemia with Oral Manifestations: Report of Case. L. F. Aseltine.—p. 266.
- Maxillary Cyst: Report of Case. F. W. Coggan.—p. 268.
- Ludwig's Angina and Anesthetic Complications. V. H. Frank.—p. 271.
- Ameloblastoma: Report of Case. N. H. McDonald.—p. 275.
- Multiple Cementoma. J. L. Bradley.—p. 278.

Monocytic Leukemia with Oral Manifestations.—A man aged 66, who was hospitalized with the complaint of "sore mouth," had been treated by his dentist and physician for Vincent's infection since the onset of the oral symptoms, eight weeks previously, but there had been no improvement. Over the gingival tissues and in the mucobuccal fold were several large ulcers that were extremely tender to palpation. Their periphery was irregular, with marginal inflammation. Examination of the neck revealed a lymphadenopathy of the submaxillary and superficial cervical glands. There was also bilateral inguinal lymph adenopathy. The liver and spleen were enlarged a full hand's breadth below the costal margin. Over the trunk and extending onto the legs were painless areas of elevation and induration surrounded by hemorrhage. The blood picture showed a red blood cell count of 2,100,000 and hemoglobin of 51 per cent. The white blood cell count was 102,000 with the cells predominantly immature monocytes. The diagnosis was (1) acute monocytic leukemia, (2) leukemia cutis, (3) secondary anemia, (4) ulcerative leukemic stomatitis. The patient died a few days later. Aseltine stresses that progressive weight loss, persistent oral ulceration, malaise, pallor and skin lesions, any one or a combination of these, should arouse suspicion of a blood dyscrasia. Patients with blood dyscrasias exhibit decreased or little resistance against infection following the removal of teeth, and local necrosis results. The leukocytes are immature and unable to combat infective organisms, and so surgical intervention is definitely contraindicated.

Journal of Pediatrics, St. Louis

25:1-104 (July) 1944

- Tibial Bone Marrow Infusions in Infancy. H. I. Arbeiter and J. Greengard.—p. 1.
- Bone Marrow Infusions as Routine Procedure in Children. F. Meola.—p. 13.
- Treatment of Poliomyelitis. W. B. Snow.—p. 17.
- Dust Bronchitis. J. A. Toomey and C. L. Petersilge.—p. 25.
- *Pneumonia, Pneumothorax and Emphysema Following Ingestion of Kerosene. E. P. Scott.—p. 31.
- Treatment of Meningococcal Meningitis and Septicemia: Sulfadiazine, Sulfanilamide and Serum Therapy. C. W. Cory, C. E. Abbott Jr. and E. G. Truszkowski.—p. 35.
- *Treatment of Pertussis with Lyophilic Hyperimmune Human Pertussis Serum. I. E. Scheinblum and J. G. M. Bullowa.—p. 49.
- Significance of Single and Multiple Shigella Infections in Institutionalized Children. O. Felsenfeld and Viola Mac Young.—p. 56.
- Spontaneous Subarachnoid Hemorrhage in Infants and Its Relation to Hydrocephalus. S. G. Babson.—p. 68.
- Analysis of Children's Eating Habits. A. L. Baldwin.—p. 74.
- Psychologic Care of Children with Pulmonary Tuberculosis. E. L. Kendig Jr.—p. 79.

Pneumonia, Pneumothorax and Emphysema Following Ingestion of Kerosene.—Scott reports the clinical history of a boy aged 2 who was admitted to the hospital two hours after he had ingested from 1 to 2 ounces of kerosene. Before bringing him to the hospital his parents gave him some cream, which caused him to vomit. Because of his apparent pulmonary edema he was given an immediate continuous infusion of 500 cc. of 20 per cent glucose followed by 10 per cent glucose in distilled water. In addition he was given oxygen continuously and caffeine with sodium benzoate. A saline enema followed by a rectal tube was used to relieve the abdominal distention. No gastric lavage was performed. Within two hours the child was conscious. The next morning his temperature had risen to 103.2 F., but he was alert and a bland diet was taken well. In view of the rise in temperature with an elevated white blood cell count, it was thought advisable to administer sulfathiazole.

His temperature became normal three days after admission and remained so until discharge. The roentgenograms revealed aspiration pneumonia, bilateral pneumothorax with possible bronchopleural fistula on the right, and soft tissue emphysema. Treatment was symptomatic except for the sulfathiazole medication. On the seventh day a roentgenogram revealed that the left pneumothorax was clearing. Both lungs had become more homogeneous. The heart was almost in the midline and the soft tissue emphysema was less severe. The patient made an excellent convalescence. Pulmonary manifestations following the accidental ingestion of kerosene are common in young children, but this is probably the first case reported with complications such as pneumonia, pneumothorax and emphysema.

Lyophil Human Serum in Pertussis.—Scheinblum and Bullova report observations on 23 patients who were selected for treatment because they were considered critically ill with pertussis as judged by their age, the severity of the attacks of paroxysms, apnea, cyanosis and emesis and the presence of pneumonic complications. The dried serum, the equivalent of 20 cc. of whole hyperimmune pertussis serum, was dissolved in 10 cc. of sterile distilled water and thus was concentrated by 50 per cent. Serum was administered intramuscularly to 22 patients; 17 of these patients received three 20 cc. doses, 4 received four 20 cc. doses and 1 received a single 20 cc. dose. Another patient received one 40 cc. dose intravenously, as suggested by McGuinness and his associates. The response of the young infants was apparently better than that of the older children. This may have been due to the fact that the age and weight of the patient were not considered in the dosage given. Sixteen of the 23 patients treated were under 1 year of age. None of these infants died. The 2 children who died were in the 1 to 2 year age group and were moribund when treatment was begun. Treatment early in the course of pertussis was effective. Two patients treated in the eighth and ninth weeks of illness had a good response. There were demonstrable circulating agglutinins following the administration of the serum. Lymphocytosis was suppressed after the administration of the serum. Eleven patients who had pneumonic involvement were treated with the serum in addition to sulfadiazine. There was no extension or recurrence of the pulmonary involvement and no development of pneumonia after a full course of serum therapy.

Journal of Thoracic Surgery, St. Louis

13:271-356 (Aug.) 1944

- Current Observations on War Wounds of Chest. B. N. Carter and M. E. DeBakey.—p. 271.
- War Wounds of Chest: Observed at Thoracic Surgery Center, Walter Reed General Hospital. B. Blades and D. J. Dugan.—p. 294.
- Trends and Practices in Thoracic Surgery in Mediterranean Theater. E. D. Churchill.—p. 307.
- *Thymectomy in Treatment of Myasthenia Gravis: Report of 20 Cases. A. Blalock.—p. 316.
- Intrapleural Infection with *Clostridium Welchii*. J. K. Poppe.—p. 340.
- *Agenesis of Lung. A. R. Valle and E. A. Graham.—p. 345.

Thymectomy in Myasthenia Gravis.—Blalock reports the results obtained in 20 patients with myasthenia gravis on whom total thymectomy was performed. The duration of illness varied from seven months to twelve years. Four of the patients had had partial remissions. The preoperative neostigmine requirements ranged from 75 to 910 mg. daily. Only 2 of the patients had a thymic tumor. Most of the others presented a persistent two lobed thymus which on microscopic examination showed lymphoid hyperplasia with germinal center formation. Four of the patients have died since operation, three of the deaths occurring in the early postoperative period. Of the 16 remaining patients 3 are well, 5 are considerably improved, 5 are moderately improved and 3 have shown little if any improvement. The early and sustained improvement which has been shown by some of the patients makes it difficult to escape the conclusion that thymectomy was at least partly instrumental in causing the alteration. Unfortunately there is no known method by which one may predict the degree of improvement which may be expected to follow the operation. The results in these cases suggest that the best chances of recovery are to be expected with patients who have not had the disease for an extended period. The 4 patients who no longer require neostigmine had had myasthenia gravis for a year or less.

Agenesis of the Lung.—Valle and Graham present the histories of 2 living patients with agenesis of the lung. One case, that of a white woman aged 41, was proved by an exploratory thoracotomy after a clinical diagnosis was made of massive atelectasis of the left lung due to complete block of the left main bronchus. The other case, that of a white boy aged 5 years, is presumed to be agenesis of the lung since the physical examination showed asymmetry of the chest, absence of breath sounds and flatness to percussion on the left side. Also the x-ray film showed complete opacity on the left with displacement of the trachea toward that side, and the bronchogram showed a complete block of the left main bronchus. A bronchoscopy was performed which confirmed these findings. Review of cases from the literature indicates that absence of a lung is not incompatible with life nor does it preclude a long life. This fact is not surprising in view of what is well known now about the postoperative course of a patient after pneumonectomy. Of the 39 cases collected from the literature 25 were of children under 12 years of age. Eleven patients lived to be more than 19 years of age and 3 were 58, 65 and 72 years, respectively. Both of the authors' patients are living and are in fairly good health at the time of this communication.

Kansas Medical Society Journal, Topeka

45:233-268 (July) 1944

- Pulmonary Suppurative Disease: Surgical Management. O. T. Clagett.—p. 233.
- Continuous Spinal Anesthesia. G. Owens.—p. 240.
- Medicolegal Aspects of Traumatic Neuroses. F. A. Carmichael.—p. 242.

45:269-304 (Aug.) 1944

- Thinking Ahead in Public Health. C. C. Applewhite.—p. 269.
- Meningococcal Meningitis and Waterhouse-Friderichsen Syndrome. H. W. Day.—p. 273.
- Ureteral Calculus—Viscerourologic Complexes. O. W. Davidson.—p. 275.

Kentucky Medical Journal, Bowling Green

42:191-214 (July) 1944

- Miliary Lesions in Lung. O. O. Miller.—p. 193.
- Neurovascular Lesions of Extremities. A. W. Allen.—p. 195.
- Pregnancy with Acute Poliomyelitis: Case Report. Alice L. Wakefield.—p. 199.
- Eighteen Months Experience on Induction Board. J. J. Moran.—p. 200.
- Preliminary Report of Committee for Study of Infant Mortality in Louisville. Margaret A. Limper.—p. 205.
- Undulant Fever. H. S. Frazier.—p. 209.

Maine Medical Association Journal, Portland

35:135-152 (July) 1944

- Presidential Address. O. F. Larson.—p. 135.
- Infectious Venereal Diseases. P. R. Briggs.—p. 137.
- Some Remarks About Aschheim-Zondek Pregnancy Tests: From Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. Elizabeth Fekete.—p. 139.

35:153-172 (Aug.) 1944

- Medical Metamorphosis. A. P. Leighton.—p. 153.
- *Browntail Moth: Its Life Cycle. Types of Skin Lesions Produced by Poison Hairs. Report of Case of Recurrent Generalized Urticaria Resulting from Contact with Poison Hairs and Its Subsequent Desensitization. C. W. Steele and W. H. Sawyer Jr.—p. 157.

Recurrent Urticaria Resulting from Contact with Browntail Moth.—According to Steele and Sawyer the browntail moth (*Nygmia paccorrea*) reappeared in great numbers in central Maine during the summers of 1940, 1941 and 1942 with a corresponding increase in the number of cases of dermatitis traceable to contact with it. The caterpillars of this insect feed chiefly on foliage of the apple and related species but may also be found on oak, willow and other common hardwood trees and shrubs. The caterpillars cause both serious poisoning to many human beings and severe economic losses through defoliation of orchards, shade trees and woodlots. In the case reported an unusually high degree of skin sensitivity was shown to the poisonous products of the browntail moth larvae. Poisonous material from the browntail moth caterpillars, from the adult moth or from the nests, when it came in contact with the man's skin produced an immediate severe generalized urticarial response. A test dose of an extract of poisonous material produced a skin reaction. Injections were given at five day intervals through the various dilutions until the maximal dose of the most concentrated solution had been given. Soon after

injections were begun the patient reported that the urticaria was decreasing. He continued to break out locally when exposed, but a generalized eruption did not appear. Two months after completion of the desensitization treatment he reported that he had obtained good symptomatic relief and that the urticaria had practically disappeared. The authors believe that even better results might be obtained if it was possible to make up the desensitization extract from the full grown larvae or from barbed hairs obtained from such caterpillars.

Tennessee State Medical Assn. Journal, Nashville

37:215-254 (July) 1944

- Demonstration of Gonococcus Cultures H Spitz —p 215
Management of Gonorrhea in General Practice J L Morgan —p 216
Present Status of Rapid Treatment of Syphilis R H Kampmeier —p 219
Management of Some Common Phases of Late Syphilis in Practice R H Kampmeier —p 222
Practical Aspects of Management of Lymphogranuloma Venereum C H Mann —p 224

37:255-290 (Aug) 1944

- Wartime Health Education V Johnson —p 255
Physiology of Thyroid Gland and Treatment of Exophthalmic Goiter W C Chaney —p 261
DDT Powder for Destruction of Body Lice A L Ahnfeldt —p 263
Standing Orders for Nurses in Industry Council on Industrial Health, American Medical Association —p 266

United States Naval Med. Bulletin, Washington, D. C.

43:209-408 (Aug) 1944 Partial Index

- Prevention of Flash Burns by Protective Glove Film G B Fauley and A C Ivy —p 209
Traumatic Rupture of Spleen G M Perisho and M Steiner —p 216
Polycystic Disease of Kidneys S S Leiter and I L Waterman —p 223
Ambulatory Program Following Operation for Unruptured Appendicitis C A Lauer and R K Kerr —p 232
Low Back Pain Subluxations of Apophysal Joints and Fractures of Articular Facets W G Scott —p 234
Tendon Repair T C Cole —p 241
Reception and Treatment of Casualties Aboard an Assault Transport B Gillespie and J C Owens —p 245
Working Rules in Field Supplementary Suggestions on Care of Wounded E Holman —p 253
Genital Manifestations of Early Filariasis R H Fogel and R W Huntington Jr —p 263
Acute Infectious Hepatitis V W Logan —p 271
Posterior Gonococcal Urethritis D H Pattison and R A Burhans —p 278
*Treatment of Cerebrospinal Fever with Penicillin Preliminary Report D H Rosenberg and P A Arling —p 281
Toothache in Low Pressure Chamber I W Brickman —p 292
Endotracheal Anesthesia for Dental and Oral Surgery W B Johnson Jr and E R Ruzicki —p 304
"Trench Mouth" Aboard a United States Naval Auxiliary Vessel D S Jancos —p 308
Analysis of Psychiatric Patients Transferred to United States from an Overseas Base J N Williams —p 311
Psychometric Procedure for Screening Mental Defectives H M Hildreth, I A Wheeler Jr and S B Williams —p 316
Study of Albuminuria in Applicants for Naval Enlistment W A Murphy —p 321
Occupational Therapy in Naval Hospital H V Hughens and L O Parker —p 325

Treatment of Cerebrospinal Fever with Penicillin—Of the 31 cases of cerebrospinal fever constituting the basis of this report by Rosenberg and Arling 22 were proved to be meningococcal in origin. In the remaining 9 patients the clinical picture and findings in the spinal fluid were characteristic of meningococcal meningitis, but the stained smears as well as cultures of the spinal fluid and blood did not reveal organisms. Whereas the majority of patients in this series recovered following only one or two intrathecal injections of penicillin (10,000 to 20,000 Oxford units) in the more severe forms of meningitis larger amounts were necessary. As little as 20,000 Oxford units given intravenously over a four hour period, together with one intrathecal injection of 10,000 Oxford units resulted in recovery in 2 instances. The amount of penicillin required by different patients will vary with the number, type and virulence of the organisms as well as with the immunologic reaction of the host and will be indicated by the clinical and bacteriologic responses. As the clinical picture presented by the patients with bacteremia was indistinguishable from that observed in many patients with negative blood cultures it is contended that penicillin should be administered both parenterally (intravenously or intramuscu-

larly) and intrathecally to all patients with cerebrospinal fever. It is of paramount importance to continue penicillin intrathecally until recovery is assured. Penicillin need be administered parenterally only during the first twenty-four to forty-eight hours of treatment or for shorter periods in the milder forms of infection.

Virginia Medical Monthly, Richmond

71:395-444 (Aug) 1944

- Rickettsial Diseases in Virginia H H Henderson and Katherine Atwood Walke —p 397
Agranulocytic Angina—A Drug Hazard E L Copley —p 416
*One Day Treatment of Sulfonamide Resistant Acute Gonorrhea with Penicillin Preliminary Report S G Page Jr and L L Hemoff —p 423
Treatment of Sulfonamide Resistant Gonorrhea with Report of 11 Cases Cured G C Tyler —p 425
Ectopic Pregnancy H H Ware Jr, W C Winn, and E C Schehn —p 428
Diagnosis and Treatment of Primary Atypical Pneumonia V. D. Offutt —p 431
Health and Government F L Apperly —p 433

One Day Treatment of Sulfonamide Resistant Acute Gonorrhea with Penicillin—Page and Hemoff report that 30 cases of sulfonamide fast acute gonorrhea became bacteriologically negative within twelve hours after treatment with penicillin was instituted. Two of the patients had had three courses of sulfathiazole, 11 two courses of sulfathiazole, while 17 had had one course. One hundred thousand units of penicillin was given in five divided intramuscular doses of 20,000 units each, at three hourly intervals, as a complete course of therapy. No toxic effects were noted, blood counts and urinalysis done at three, twelve, twenty-four and forty-eight hour intervals were normal, urethral smears and cultures taken at three hour intervals during the course of treatment became negative within a period of twelve hours.

West Virginia Medical Journal, Charleston

40:245-276 (Aug) 1944

- Traumatic Injuries of Kidneys G C Prather —p 245
Sporadic Meningococcus Meningitis Report of 2 Cases W P Boger —p 248
Emergency Maternity and Infant Care Program A J Lesser —p 254
Distribution of Pain in Lesions of Upper Urinary Tract Report of Cases T B Washington —p 257

40:277-308 (Sept) 1944

- *Some of the Uses of Cutis (Derma) Graft Transplant in General Surgery, Orthopedic Surgery and Gynecology J L Cannaday —p 277
Accidents of Pregnancy S A Cosgrove —p 283
Some Dangers of Venoclisis in Cardiovascular Disease R A Houston —p 292

Uses of Cutis (Derma) Graft Transplant—The term "cutis graft" means skin from which a thin layer of epidermis has been removed with a skin graft razor. Cannaday suggests that the reason this material is not utilized more widely in this country is the misconception that it is likely to cause epidermoid cysts. There is no record of the development of epidermoid cyst following the use of cutis graft. The cutis graft is gradually infiltrated with and is replaced by connective tissue, so that finally the graft takes on the characteristics of the structure that it replaces. In a hernial repair it is converted into fibrous tissue that resembles aponeurotic tissue, and when used to replace tendon it is rapidly converted into tissue resembling tendon. When used in the reconstruction of joints like the hip and knee joints it takes on the characteristics of normal joint lining. Cutis graft tissue can be used anywhere that fascia lata or other aponeurotic tissue has been used in the past. The author and his associates in the Charleston General Hospital have made use of cutis grafts in a total of 72 cases. The list includes several types of hernia, operations to suspend the uterine cervix for the relief of prolapse, wobbling knees, fractures of the patella, replacement of torn dura, support of the bowel in sigmoid colostomy and the like. Cutis may be used in all cases in which the use of fascia or tendon might be indicated with the expectation of better results. It heals rapidly and well, has great vitality, is able to survive under adverse conditions, possesses great tensile strength, has a good blood supply, gradually assumes the function of the part it replaces and is readily available. Its greatest value perhaps is in the repair of large incisional hernias.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

19:43-98 (June) 1944

- Incidence of Rickets in Wartime. British Paediatric Association.—p. 43.
Survey of Rickets in Lincolnshire (Parts of Kesteven). R. W. B. Ellis and Audrey E. Ellis.—p. 45.
Statistical Analysis. P. Stocks.—p. 48.
*Incidence of Rickets in Children Attending Hospitals in Bristol from September 1938 to May 1941. B. D. Corner.—p. 68.
*Observations on Tuberculous Meningitis. J. McMurray.—p. 87.
Analysis of Fate of Premature Babies in Warwickshire for 1942 and 1943. C. F. Brockington.—p. 93.

Incidence of Rickets in Children Attending Hospitals in Bristol.—Corner describes investigations on the prevalence of rickets among infants under the age of 2 years who were attending hospitals in Bristol during the period from September 1938 to May 1941. Particular emphasis has been laid on the diagnosis of mild rickets during the first six months of the infant's life, as at that stage prophylactic measures would be most useful. Since the clinical diagnosis of rickets is apt to be uncertain in mild cases, the plasma phosphatase was estimated and correlated with the clinical evidence. X-rays were used in only a few cases, and serum phosphorus and calcium estimations were available in some cases. Microscopic examination of the ribs post mortem was carried out in a few cases. Evidence of rickets was searched for in 820 children in the age range of 2 weeks to 2 years. Rickets in which there were clinical signs and either x-ray evidence or an increase in the plasma phosphatase above 15 units was found in 31.4 per cent of the children. A further 3.9 per cent of patients may be considered to be early cases, since they showed no clinical evidence of rickets but the phosphatase was raised above 15 units. Some clinical signs suggestive of rickets were shown by 14.5 per cent of children, but other investigations were negative. There is a correlation between an increase in the plasma phosphatase and definite enlargement of the costochondral junctions, but when the enlargement is only slight the phosphatase is below 15 units in 81 per cent of cases, so that slight enlargement of costochondral junctions alone is not diagnostic of rickets. The incidence of rickets was greatest during the period six to nine months, when it was 52 per cent, and from twelve to eighteen months, when it was 48 per cent. Below the age of 6 months there were 26.2 per cent of definite cases. The incidence of rickets is 5 per cent lower in breast fed infants than in artificially fed infants. There is little difference in the incidence of rickets in infants who were fed on dried milks, milk mixture or sweetened condensed milk. The incidence of rickets in children who had received vitamin D supplement, which, however, often contained less than 400 units in the daily dose, was 10 per cent higher than in the other cases. The incidence of rickets did not show a definite relationship to rate of gain in weight except in the youngest group of infants. The incidence of rickets in twin and premature infants is not greater than the average for the whole age range, but in the youngest group of patients the incidence is doubled in the twin and premature infants. There appeared to be a definite relationship between the incidence of rickets and the type of antepartum diet of the mother. The incidence of rickets was greatest when the mother's diet was poor. Accessibility of direct sunlight and economic status of the family play a considerable part in the incidence of rickets.

Tuberculous Meningitis.—McMurray investigated two aspects of tuberculous meningitis: (1) the question why it does not arise in every case of tuberculous bacillema and (2) with what frequency the bovine type of tubercle bacillus occurs in tuberculous meningitis. Eleven patients with tuberculous meningitis were examined to determine the pathogenesis of the condition. It appeared that tuberculous meningitis commonly arises as the result of the extension into the subarachnoid space of a focus in the meninges or in the juxtameningeal tissues. This focus is blood borne and may or may not be one of the foci of miliary tuberculosis. Cerebrospinal fluids from 26 cases of tuberculous meningitis have been examined. Tubercle bacilli were found microscopically in 20 and strains have been isolated

in 24. Of the 24 strains isolated, 7 were of the bovine type and the other 17 of the human type. All the bovine strains occurred in the 20 children under 15 years of age. The source of infection with the bovine strains could not be established.

British Journal of Dermatology and Syphilis, London

56:107-150 (May-June) 1944

- Reticuloses. W. N. Goldsmith.—p. 107.
Lymphadenoma: Its Etiology and Its Skin Lesions. E. C. Warner.—p. 129.

British Medical Journal, London

2:67-102 (July 15) 1944

- Current Progress in Sterilization of Air. S. Mudd.—p. 67.
Intravenous Barbiturates in Treatment of Hysteria. C. Lambert and W. L. Rees.—p. 70.
Two Cases of Gunshot Wound Resulting from Unusually Large Missiles: Recovery. R. Charles.—p. 73.
Modification of Invagination Method of Intestinal Anastomosis. J. B. Hogarth.—p. 75.
Method of Locating Mobile Renal Calculus at Operation. B. W. Goldstone.—p. 77.

2:103-136 (July 22) 1944

- Some Problems in Riboflavin and Allied Deficiencies. H. S. Stannus.—p. 103.
Two Years of Military Psychiatry in Middle East. H. B. Craigie.—p. 105.
Diagnosis and Treatment of Lesions Due to Vesicants. W. E. Chiesman.—p. 109.
Rupture in a Supposed Lower Segment Cesarean Section Scar. D. W. James.—p. 112.
Meigs's Syndrome: Hydrothorax and Ascites in Association with Fibroma of Ovary. A. C. Clay, R. N. Johnston and L. Samson.—p. 113.

Lancet, London

2:97-130 (July 22) 1944

- Naval Experience in Relation to National Health Service. S. Dudley.—p. 97.
*Dissection Lobectomy for Bronchiectasis: Review of 100 Cases. T. H. Sellors, V. C. Thompson and G. Qvist.—p. 101.
*Influenza A Outbreak of October-December 1943. C. H. Andrewes and R. E. Glover.—p. 104.
Vocalinal Aspects of Neurosis in Soldiers. A. Lewis and K. Goodyear.—p. 105.
Finger Exerciser for Burned Hands. M. C. Oldfield and C. J. King.—p. 109.
Hydronephrosis as Cause of Backache. P. C. Mallam.—p. 110.
Successful Suture of Finger Flexor Tendon. R. M. Jones.—p. 111.

Dissection Lobectomy for Bronchiectasis.—Sellors and his collaborators point out that the dissection method of lobectomy has the advantages over the tourniquet method that the possibility of secondary hemorrhage is much diminished by individual ligation of artery and veins, the chances of fistula formation are diminished by careful closure of the bronchus, sepsis in the hilar stump is eliminated and the removal of the lobe can be said to be total rather than subtotal, which is the case in the tourniquet operation. A further problem in the evolution of the operation is the closure of the bronchus. When a reliable method of bronchial exclusion and the avoidance of fistula is discovered, lobectomy will have reached all the standards required of clean aseptic surgical technic. The 100 cases reviewed here were a consecutive series in which dissection lobectomy was done for suppurative bronchiectasis. The operative mortality was 6 per cent, and good results were obtained in 83 per cent. The most striking feature of the postoperative course has been the low incidence of pulmonary sepsis, and this is probably due to elimination of the hilar slough inevitable with tourniquet lobectomy. The incidence of postoperative atelectasis was high (29 per cent) but secondary pyogenic infection was exceptional. Pleural adhesions tend to lower the incidence of massive collapse, but their most important function is to expedite resolution of this condition. The commonest postoperative infection was tuberculosis, which developed in 7 cases, being fatal in 3. Pulmonary lobectomy by dissection is unquestionably a great advance on the tourniquet operation.

Influenza A Outbreak of October-December 1943.—

According to Andrewes and Glover there occurred during the last quarter of 1943 in Britain the most widespread outbreak of influenza since the early months of 1937. Clinically the epidemic was mild. The small amount of influenza prevalent in the early months of 1943 was largely due to influenza virus B, but in April and in most of the summer months localized outbreaks occurred chiefly in service units, and serologic tests

(Hirst's technic) indicated that virus A was concerned. Hirst tests on serums obtained from patients who had respiratory infections between October and December yielded a high percentage of A positives. No rises in titer against influenza B virus was found. The strains isolated readily infected ferrets but were not easily adapted to mice. The serologic evidence indicates that at least 72 per cent—and perhaps 90 per cent—of the cases of influenza studied from October to December 1943 were due to influenza A virus. If the material available was a fair sample of that to be found in the country generally, this was a fairly pure A outbreak. Influenza virus B played no apparent part. Influenza of a similar type prevailed in the United States in the autumn of 1943 and also was predominantly of type A.

Medical Journal of Australia, Sydney

1:477-500 (May 27) 1944

Rh Factor: Laboratory Aspects Rachel Jakobowicz and Lucy M. Bryce.—p. 477

*Importance of Rh Factor in Obstetrics Vera Krieger—p. 480
Rh Factor: Ethnological Aspects R. T. Simmons and others—p. 483
Time Saving Mastoidectomy Dressing J. R. Hutcheon—p. 485

1:549-572 (June 17) 1944

Experimental Empiricism in Chemotherapeutic Research E. Singer—p. 549

Rh Factor in Blood of Australian Aborigines R. T. Simmons, J. J. Graydon and Patricia Hamilton—p. 553

Some Reflections on Amnesia, Psychiatric and Forensic G. L. Ewan—p. 554

Medical Applications of Maze Test S. D. Porteus—p. 558

1:573-596 (June 24) 1944 Partial Index

Scope of Mental Testing D. W. McElwain—p. 573.

Contribution of Mental Tests to Medicine J. V. Ashburner—p. 575

Asphyxia in Newborn W. K. McIntire—p. 580

Solar Radiation and Pernicious Anemia in South Australia J. B. Thiersch—p. 583.

Rh Factor in Obstetrics.—Krieger reviews work on the Rh factor carried out at the Women's Hospital in Melbourne. Rh negative blood tests were made on the blood of all pregnant patients whose previous history had shown evidence of miscarriage or stillbirth. Four hundred and eighty-six such patients were tested between May and October 1943, and 101 (21 per cent) were found to have Rh negative blood. The author reviews the results of tests for Rh antibodies during and after delivery on mothers with Rh negative blood. With regard to the frequency of erythroblastotic children from mating of persons with Rh positive and Rh negative blood, the author finds that not all the babies of a mother with Rh negative blood and a father with Rh positive blood have Rh positive blood. Since the Rh factor is transmitted as a mendelian dominant, the fate of the children depends on the father's being homozygous or heterozygous for the factor. Furthermore, not every mother with Rh negative blood will produce isoantibodies to the Rh factor, and the amount of antibodies formed in any one pregnancy varies considerably. The mildest form of erythroblastosis, the hemolytic anemia of the newborn, may not be diagnosed as such unless attention has been directed to the possibility of its presence. Mild forms of erythroblastotic icterus may be classified as a rather severe ordinary icterus neonatorum if no special investigations are made. Although nothing can be done to prevent the action of Rh substance from the baby from producing Rh antibodies in the mother, or the passage of these antibodies through the placenta into the fetal circulation, the testing for the Rh factor and for Rh antibodies is necessary for several reasons, for instance, for proper blood selection, should either mother or child require a transfusion. The Rh factor should be investigated not only in women whose past history suggests the occurrence of erythroblastosis but in all women attending antepartum clinics at maternity hospitals. The question of the production of sufficient suitable typing serum is all important. Many difficulties are experienced in obtaining blood from the patients, even when a high titered serum has been detected. There is the fact that the titer of antibodies usually decreases rapidly. This necessitates the taking of blood from the patient within a week or two after her confinement. The patient or her doctor may object to this. There is also the question of variability of titer and "polyvalence" in serum from these patients.

Monatsschrift für Psychiatrie und Neurologie, Basel

108:177-232 (Oct.) 1943

Anatomicoclinical Study of Complex Hyperkinetic Syndromes, Late Post Traumatic Dementia with Progressive Rigidity and Tremor. G. de Morsier and L. V. Bozaert—p. 177

*Nonconvulsive Electric Treatment in Depression P. Plattner and H. Löhmus—p. 209
Juxtamedullary Dermoid Cyst L. Bakay, L. Benedek and A. Juhl—p. 222.

Nonconvulsive Electric Treatment in Depression.

According to Plattner and Lohms it has been generally accepted that convulsions in the form of epileptic attacks are indispensable for the success of electric and other shock treatments and therefore the aim has always been to avoid incomplete attacks. The unpleasant complications such as wrenching of muscles and fractures were accepted as inevitable or attempts were made to minimize them by posture. Others, particularly American investigators, studied the possibility of reducing the convulsions by the use of curare or magnesium sulfate. The authors also unsuccessfully tried the use of magnesium sulfate but then decided to try weaker currents to avoid convulsions completely. They produced "absences" (temporary suppression of mental function) by passing a current of 60 volts for 0.1 second. The patient loses consciousness for only a few seconds and often is unaware that treatment has been given. More than 50 patients who on the average passed through 20 absences never experienced unpleasant sensations. A number of illustrative cases are reported. The authors conclude that for combating the depressive syndrome by electric irritation of the brain the elicitation of motor manifestations is superfluous and that the essential factor is that other, probably sympathetic, centers are stimulated. The convulsive manifestations may be undesirable secondary effects. It was found that arteriosclerotic and senile depressions can be effectively treated by the use of weaker currents that are tolerated even by old and fragile patients. Stronger currents are necessary in climacteric, involutional and endogenous depressions and such currents may produce convulsions and epileptic attacks, but to avoid the risk of fractures phenobarbital can be given, which does not interfere with the therapeutic effect of the electric current.

Rev. Argent.-Norteam. de Cienc. Méd., Buenos Aires

1:831-926 (Feb.) 1944 Partial Index

*Three Tests for Differential Diagnosis of Jaundice Lola Moyano Lopez—p. 855

Traumatic Rupture of Spleen H. T. Day—p. 885

Three Tests for Differential Diagnosis of Jaundice.

Moyano López performed tests of total blood bilirubinemia, phosphatemia and the Hanger test on 321 patients with jaundice. She concludes that the blood bilirubin test is of greatest value in recognizing parenchymal involvement of the liver. The blood phosphatase test is sensitive and reliable in the diagnosis of bile tract obstruction. Hanger's test is of moderate value in the diagnosis of alterations of the liver parenchyma. The average normal value of blood phosphatase in adults varies from 15 to 4 Bodansky units. Lower figures indicate a bad prognosis. Blood phosphatase is slightly increased in the course of hepatitis. It may reach an average value of 10 Bodansky units. A lowering of blood phosphatases approaching normal values in the course of hepatitis together with a lowering of the figures of blood bilirubin and a decrease of the Hanger test indicates a favorable course of the disease. A sudden acute increase of blood bilirubin to very high values after a drop to 50 or 90 mg of bilirubin per thousand cubic centimeters of blood together with unchanged results of the blood phosphatases and Hanger's tests indicate a fatal prognosis. If blood bilirubin reaches high figures and then drops to 80 or 90 mg and remains at these levels while the blood phosphatase increases beyond 10 Bodansky units and the Hanger test increases, the case is one of hepatitis complicated by bile tract obstruction. In a case of jaundice, if blood phosphatase is slightly above 10 Bodansky units, blood bilirubin about 200 to 300 mg per thousand cubic centimeters and Hanger's test is faintly positive, jaundice is due to an old obstruction which has affected the liver in such a way as to lead to hepatitis.

Book Notices

The Pathogenesis of Tuberculosis. By Arnold R. Rich, M.D., Associate Professor of Pathology, The Johns Hopkins University School of Medicine, Baltimore. Cloth. Price, \$10.50. Pp. 1,008, with 90 illustrations. Springfield, Illinois & Baltimore: Charles C Thomas, 1944.

This timely book by Rich, well qualified by training and experience to present the subject of pathogenesis of tuberculosis, is written clearly and in orderly style. It incorporates the basic factors and principles which influence the occurrence of tuberculous infection or determine its progression or arrest. An analysis within the present limits of our knowledge up to 1940, about the time the bibliography ends, considers the influence of each of those factors on the pathogenesis of the disease. This compilation of the literature brings into a unified whole the basic and interdependent but scattered and isolated facts contributed by bacteriology, immunology, pathology, clinical observation, experimental investigation, epidemiology and genetics. The book is broader than previous treatises on tuberculosis alone and includes an analysis of the basic principles that govern infection and resistance in general. Whenever a stand is taken, it is based on the first hand examination of original papers, to which there are 1,417 references, or from the author's personal experiences. In the author's words in the preface, "Those who deal with the manifold problems of tuberculosis in their work or teaching are faced continually with the need of a survey," such as this book presents. The author has endeavored to present the principles of native and acquired resistance and hypersensitivity, as far as they are understood at present, in a manner that will enable those who are not specialists in immunology to understand them readily.

Without becoming too critical, it is hoped that the author will not be content to let this issue stagnate before revamping it at regular intervals for new editions and will seek the advice of others qualified in this field. The shortcomings of single authors for extensive volumes should be recognized. However, full credit should be given Rich for the stupendous task he has performed in preparing a volume on the pathogenesis of tuberculosis the equal of which has never before appeared in English. His subject is driven methodically toward a goal beginning with the relations of the chemical constituents of the bacillus to pathogenesis, in which he displays chemical capability. The types of bacilli, variations in form and potentialities are well defined. Under virulence he points out that the study of the bacilli from human sources is not adequately fulfilled nor can we regard different forms of spontaneous disease as being specifically determined by the degree of virulence of the infecting bacilli. Native resistance is elaborately considered in four complete chapters to the conclusion of its mechanism. Following local tissue resistance, hypersensitivity and its mechanism are dwelt on, leading into the problem of specific and nonspecific desensitization; this chapter will require radical modification in new editions because of the uncertain status of this phase of tuberculosis prior to 1940. The mechanism of acquired resistance is fully detailed and climaxed by a good chapter on the factors that influence resistance. The influence of the number of bacilli impresses one with how a simple phase of tuberculosis still requires elucidation. Finally the problems responsible for the characteristics of tuberculous lesions and symptoms, exogenous or endogenous reinfection and the application of the principles of pathogenesis as illustrated by tuberculosis of the lungs, meninges and serous cavities complete the picture of tuberculosis sufficiently to conclude with the decline in the mortality and the future outlook, which becomes the expression of the author as to the importance of each of the major factors. Rich does not appear to contribute to the view that tuberculosis will be self extinguished with the mortality curve trend. He feels that "the disease that still kills more than twice as many individuals as any other single cause of death during this (15 to 44 years of age) particularly productive and enjoyable period of life span can hardly be jubilantly regarded as being 'nearly conquered.'" To the latter view most tuberculologists and investigators will certainly contribute at present. Such a view also attests the need for this volume, and it is doubtful whether any single author could have done a better job with

so complex a problem as the pathogenesis of tuberculosis and all its implications than Rich did.

The volume is well composed and is worth possessing. It will help students and medical men to a better understanding of tuberculosis.

Simplified Diabetic Management. By Joseph T. Beardswood Jr., A.B., M.D., F.A.C.P., Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania, Philadelphia, and Herbert T. Kelly, M.D., F.A.C.P., Associate In Medicine, Graduate School of Medicine, University of Pennsylvania. Fourth edition. Cloth. Price, \$1.50. Pp. 172, with 9 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

As a manual for the diabetic patient, this volume covers the ground thoroughly and in a manner both concise and clear. The present edition is somewhat revised, notably by the addition of a section on the newer insulin preparations with prolonged action. The inclusion of crystalline insulin among the latter is a rather surprising lapse in an otherwise accurate presentation. The authors present two systems of diet calculation, the unit method and the percentage method. Both are clearly and simply explained and accompanied by the appropriate tables of food values. However, it is apparent that the authors have abandoned their earlier use of the diet prescription chart based on the "line-ration schemes" of Lawrence and of Christian and O'Hara. In view of this it is rather strange that, although all reference to it has been removed from the text, the chart is still included in the volume and is still featured in the blurb on the dust cover.

Conferências do curso de aperfeiçoamento de psiquiatria de guerra (organizado pelo Prof. A. G. Pacheco e Silva sob os auspícios da Faculdade de medicina da Universidade de S. Paulo e dos fundos universitários de pesquisas para a defesa nacional). Paper. Price, Cr. \$50.00. Pp. 301, with 11 illustrations. São Paulo, 1943.

The volume presents the twenty-two lectures given during 1943 in a postgraduate course on war psychiatry organized by Dr. Pacheco e Silva, professor of psychiatry in the University of São Paulo. Dr. Pacheco e Silva and fifteen of his colleagues have embodied a thorough study of the various applications of psychiatry to the problems of war; considering first the general scheme of examinations, they proceed to the various clinical pictures as met in a military setting, then to such problems as malingering, laws and regulations, and mental hygiene, individual and collective. The volume is substantial evidence of the foresight and progressive scholarship of our psychiatric colleagues in Brazil.

The Woods Hole Marine Biological Laboratory. By Frank R. Lillie. Cloth. Price, \$4. Pp. 234, with 28 illustrations. Chicago: University of Chicago Press; London: Cambridge University Press, 1944.

The Woods Hole Marine Biological Laboratory is a unique institution located on the south shore of Cape Cod on a spit of land between Buzzards Bay on the one side and Vineyard Sound on the other. It is a research and collecting institute joined by strong ties to departments of zoology in many of the country's leading universities. Its importance to medicine lies in its fundamental contribution to an allied science and in the not inconsiderable number of physicians who have received early biologic training in this laboratory. Professor Lillie has been closely connected with the laboratory since its earliest days, and it is both fortunate and appropriate that he should be the author of this welcome history of its scientific and economic development.

Leukopenia and Agranulocytosis. By William Dameshek, M.D., Clinical Professor of Medicine, Tufts College Medical School, Boston. Edited by Henry A. Christian, A.M., M.D., LL.D., Clinical Professor of Medicine, Tufts College Medical School. [Reprinted From Oxford Loose-Leaf Medicine with the Same Page Numbers as in That Work.] Cloth. Price, \$1.75. Pp. 841-852. New York, London & Toronto: Oxford University Press, 1944.

This monograph summarizes the present knowledge of conditions in which the leukocyte count is decreased. The material is timely, for, as Dr. Christian says in the preface, "interest in leukopenia and agranulocytosis has been increased markedly in the present period because not infrequently both appear as toxic manifestations of the therapeutic use of sulfonamide drugs." The subject matter is well arranged and presented, and the bibliography of 152 references is selected from the rather extensive literature on the subject. Of especial value are the sections on etiologic factors and on treatment.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MORTALITY OF BREAST AND BOTTLE FED INFANTS

To the Editor:—Can you give me information on the proportion of women who can nurse their babies? Most physicians now seem to advise bottle feeding as at least equally desirable. What is the comparative mortality of breast and bottle fed babies?

Mabel D. Murphy, M.D., Glendale, Calif.

ANSWER.—Sanford (Various Complementary Feedings Used During the Neonatal Period, *THE JOURNAL*, Aug. 5, 1939, p. 470) in a study of 4,622 infants during the newborn period found that 14 per cent of the mothers were unable to nurse their babies, 30 per cent required some complementary feeding and 56 per cent were able to give their babies sufficient breast milk by the end of the tenth day of life. Statistics on the mortality of breast and bottle fed babies are open to criticism unless they represent the same group and environment and are large enough and cover a long enough period of time to make a fair comparison. In the Infant Welfare Society of Chicago from 1924 to 1929 in 20,000 babies under 1 year of age in which 91.5 per cent were completely or partially breast fed and 8.5 per cent artificially fed, the mortality was 11 per thousand. Of this mortality 66 per cent were artificially fed, 27.2 per cent partially breast fed and 6.7 per cent completely breast fed. In the same organization in 1943, 6,702 babies under 1 year of age were cared for with approximately the same proportion of feeding. The mortality has now dropped to 4 per thousand, but still of this mortality 65 per cent were artificially fed, 28 per cent partially breast fed and 7 per cent breast fed.

DIFFERENTIAL DIAGNOSIS OF APICAL OPACITIES

To the Editor:—A soldier aged 23 was hospitalized four months ago and carefully studied because of the presence of infiltrative lesions of both lung apices. Diagnosis of atypical pneumonia was finally made. The patient has now been asymptomatic for about three months. He states that he feels well, and his general appearance is that of a person in good health. However there is no x-ray evidence that the lesions are either regressing or progressing. Other data are negative. Would this man be qualified for full duty or light duty or should he be hospitalized until the lung lesions have disappeared?

Lieutenant, M. C., A. U. S.

ANSWER.—What led to the discovery and careful study of the abnormal shadows in the lungs? Were they discovered during and after an acute sickness resembling virus pneumonia? If the soldier actually had a form of virus pneumonia the residual changes in the lungs are probably of no importance and he would be qualified for full duty. Residual shadows are common after virus pneumonia because of the interstitial location of the lesions. Nevertheless, it is unusual for changes to persist so long and in both apices. Under the circumstances mentioned, unless the acute attack was observed, it is not safe to make a diagnosis of virus pneumonia in retrospect simply because of the changes recorded, as apparently was done. The abnormality may have been present for a long time before. The roentgenogram made at the time of induction should be reviewed for comparison.

Pulmonary tuberculosis is a strong possibility as the cause of the apical densities, and the case should probably be regarded as such until proved otherwise. Further appropriate investigation along this line is advised. Virus pneumonia and pulmonary tuberculosis are sometimes difficult to differentiate, as recently discussed by Yaskalka (*Am. Rev. Tuberc.* 49:408 [May] 1944). The management of a suspected case of tuberculosis is fully covered in Army Medical Regulations.

GAUZE SPONGE IN ABDOMINAL SURGERY

To the Editor:—Please give an opinion on the use of the small dry gauze sponge in the abdominal cavity. If intestines are held and they slip, will such a sponge cause adhesions?

J. Louis Waldner, M.D., Loveland, Colo.

ANSWER.—It is not possible to predict whether or not in any given case adhesions will form following an operation. Traumatizing the peritoneum favors formation of adhesions. If the intestine is to be held for any length of time, it would be preferable to use a wet sponge rather than a dry gauze sponge as suggested in the query.

HOMOSEXUALITY AND ENDOCRINE IMBALANCE

To the Editor:—At one of our clinical conferences we discussed the subject of homosexuality. It was the opinion of one of the medical officers that recent work has shown an excess of estrogen in the blood, spinal fluid and urine in a large number of homosexuals of both overt and latent types. This was disputed by another medical officer, who claims that recent work at Hartford, Baltimore and Philadelphia has failed to show any such findings. In view of the fact that our medical references are inadequate, I take this opportunity to ask the following questions: 1. What is the latest concept concerning the estrogen content in (a) homosexuals, overt type, and (b) homosexuals, latent type? 2. What is the latest work done on this subject, where was it done, and what are the findings? 3. Is the treatment of homosexuals purely a psychiatric problem, an endocrine problem or both? 4. What percentage of homosexuals do show endocrine imbalance, and what type imbalance is it?

M.D., Washington.

ANSWER.—Surprisingly little quantitative laboratory work has been reported in the study of homosexuality from an endocrine point of view. The most recent publication is by Abraham Myerson and Rudolph Neustadt (Bisexuality and Male Homosexuality: Their Biologic and Medical Aspects, *Clinics* 1:932 [Dec.] 1942). This article provides, in addition to discussion, an adequate bibliography of the other recent work. These authors agree fundamentally with the conclusions of C. A. Wright (*M. Record* 154:60 [July 16] 1941) that the commonest pattern in the urinary excretion of male homosexuals is a relative increase in estrogenic substance and decrease in androgenic substance. This is not always an absolute increase or decrease from the normal pattern. Myerson and Neustadt state that "it becomes necessary, in all candor, to point out certain serious shortcomings in the chemical studies of urine hormone: (1) Urine is an excretion and, therefore, cannot adequately measure endocrine activity; (2) the methods are imperfect and, for example, do not measure testosterone but only its breakdown products; (3) inert chemical substances, so far as sexual activity is concerned, participate in the color reactions, and so some falsification of the values occurs; (4) the patients do not live under standard experimental conditions. Nevertheless, and despite all these shortcomings, certain clinical facts are correlated to the urinary findings in definite ways, so that diagnostic facts of importance emerge."

It should be noted that the conclusions of Wright and his group have been vigorously challenged by A. C. Kinsey (Homosexuality: Criteria for a Hormonal Explanation of the Homosexual, *J. Clin. Endocrinol.* 1:424 [May] 1941). The objections raised are on the basis of inadequate grounds for statistical conclusions by the authors. Kinsey produces evidence of a frequent homosexual tendency among males who also have heterosexual interests and capacities but contributes no further information about the hormone picture.

It is manifestly too soon in the process of endocrine study of this field to answer the question about the percentage of homosexuals who show endocrine disturbance, let alone to decide how frequently homosexuality is an endocrine, how frequently a psychiatric, problem. Myerson and Neustadt feel that they see evidences of endocrine disturbance in 83 per cent of all cases of overt male homosexuality examined as compared to a similar endocrine disturbance in not more than 2.5 per cent of other cases studied. They are unable to come to any conclusion as to which is primary, the psychologic or the endocrine disturbance.

PSORIASIS

To the Editor:—For several years I have had moderate psoriasis; at times it is clear, and again it becomes severe. It is worse at present on the scalp and the arms and legs. Exposure to sunlight, less effectively to ultraviolet radiation, daily, for thirty days practically eliminates the psoriasis. However, it is impossible for me to do that, being so busy. Have large doses of vitamin D, by mouth, given equivalent results to those obtained by daily exposure to sunshine? Would it be advisable to take the oily vitamin since most patients with psoriasis have a high cholesterol? Would the oil increase the cholesterol? The studies on lipocac which were demonstrated at the session of the American Medical Association in Cleveland were encouraging, but I have seen no reports on that since. Is lipocac available to the general practitioner as yet? What suggestions can be offered for the treatment of this stubborn disease?

M.D., Iowa.

ANSWER.—Cedar and Zon (Treatment of Psoriasis with Massive Doses of Crystalline Vitamin D and Irradiated Ergosterol, *Pub. Health Rep.* 52:1580 [Nov. 5] 1937) treated 15 patients with psoriasis, all between 30 and 50 years of age and all with old psoriasis resistant to treatment. They were given pure crystalline vitamin D in sesame oil, 50,000 units to the capsule containing 5 minims (0.3 cc.) of sesame oil, six capsules per day. These were taken between meals to avoid any augmentation of their action by milk products in the diet, as suggested by Lewis (*J. Pediat.* 8:308 [March] 1936). Of these patients 11 were cleared of lesions in from six to twelve weeks of treatment. The blood calcium was estimated at intervals and was

seen to increase slowly in all but 1 case. It reached 12 mg. per hundred cubic centimeters in some and up to 16 mg. per hundred cubic centimeters in others. Three untoward reactions were seen in the tenth to the twelfth week of treatment: anorexia, nausea and urinary frequency. These reactions occurred after the lesions of the skin had cleared, and they disappeared on cessation of treatment. Patients with calcified pulmonary tuberculosis, as evidenced by roentgen examination, were excluded from this group to avoid possibility of absorption of the protective calcium. Six patients had mild recurrences in from eight weeks to five months after treatment had been stopped. One of these responded to a second and again to a third course of treatment for eight to ten weeks. Four other cases had remained clear of lesions three to eight months after the end of the treatment.

Neither vitamin D nor lipocain can produce results to equal those of actinotherapy in the treatment of psoriasis. Most dermatologists get better results from the Goeckerman treatment than from any other one method. O'Leary (Goeckerman Method of Treating Psoriasis, *Canad. M. A. J.* 48:34 [Jan.] 1943) describes it in detail as practiced in the place of its origin. The ointment, consisting of

	Gm. or Cc.
Crude coal tar.....	2.0 to 4.0
Zinc oxide	2.0
Corn starch	50.0
Petrolatum to make.....	100.0

is applied thickly and a suit of cheap underwear is worn over it. Once a day the ointment is removed except for a thin film and the ultraviolet light given through this film, enough to cause a slight erythema. The dose is increased daily to maintain the erythema without causing blisters. Then the patient spends one-half to two hours in a bath at 95 F. After this the ointment is again applied. Every other day autohemotherapy is given, the series ending with the fifth treatment. On the scalp, in place of the coal tar ointment, one containing 5 per cent ammoniated mercury and salicylic acid is used. This course of treatment necessitates a stay in the hospital for two weeks. Most dermatologists find the hospital treatment hard to sell to their patients, who prefer a longer course of milder treatment compatible with continued work. Keim's modification calls for application of a 2 to 10 per cent crude coal tar in cetyl alcohol emulsion base before retiring, and in the morning a tar bath. At the doctor's office undiluted solution of coal tar is painted on each lesion before the ultraviolet treatment is given.

HARRIS DRIP PROCTOCYCLYSIS—"GAS PAINS"

To the Editor:—What is the present status of the Harris drip used post-operatively? Does it reduce distention? How much water is absorbed by this method in twenty-four hours? Does it produce peristalsis in the small intestine? If it does, is not this harmful in the presence of peritonitis? What are "gas pains"? Can you tell me when the original paper on this method was published? Frances B. Doyle, M.D., Brooklyn.

ANSWER.—The Harris drip, unlike the continuous drip proctoclysis first introduced by the late Dr. John B. Murphy, has never been adopted extensively by the profession, and many experienced surgeons and clinicians are unfamiliar with it. The available literature on this method is conspicuous by its extreme paucity. In the light of current methods of preoperative preparation and postoperative treatment its present status must be considered as obsolete in large measure. There are no available recorded observations on the influence of the Harris drip on distention, on the amount of water absorbed in a twenty-four hour period or on its influence on peristalsis in the small bowel. The late Joseph Blake of New York, in a discussion of the postoperative treatment of infective peritonitis (*Nelson Loose Leaf Surgery* 5, pp. 22-23), regarded the Harris method as superior at that time.

There appear to have been few authoritative experimental or clinical observations with respect to the factors underlying the production of "gas pains." Such gas pains have been attributed to a variety of causes, including preoperative or postoperative purging, the excessive use of opiates, the nature of the anesthetic, rough handling of tissues during operation, too early or too late feedings and the like. A conventional discussion of the subject is found in Cutting's *Principles of Preoperative and Postoperative Treatment* (New York, Paul B. Hoeber, Inc., 1932, pp. 311-342). However, Mendes-Ferreira's roentgenologic observations on human subjects (*Proc. Staff Meet., Mayo Clin.* 13:222 [April 6] 1938) greatly discount the importance of gas in the genesis of postoperative abdominal pains, so that the expression "gas pains" is in all probability a misnomer. No reference has been found to any published original paper on the Harris method.

INDUSTRIAL EXPOSURE TO MERCURIOS CHLORIDE

To the Editor:—A problem has arisen in a drug manufacturing business. The main product is a venereal disease prophylactic. The women who fill the tubes and clip, wipe and pack them naturally get calomel ointment (33½ per cent) on their hands, but they are instructed to wash their hands well with soap and warm water, using a brush, at noontime and again before leaving for home in the evening. Until recently no employee has complained of mercurial poisoning. One employee, after six weeks of this work, was confined to bed for ten days, complaining of pains in various joints, especially the knees, ankles and spine; she also had diarrhea but no soreness of the gums. At the time of her illness she had just completed a course of eight injections, twice weekly, of synodal. Another employee about 45 years of age after three weeks' work complained of stiffness and pains in the joints, especially in the legs, but no soreness of the gums or diarrhea. I insisted that these 2 women were not suffering from mercurial poisoning because of the lack of typical symptoms of mercurial poisoning, their careful personal hygiene, the lack of abrasions on the hands, the shortness of time of employment, and the fact that there have been no other cases among many employees since 1921.

R. M. Nicholson, M.D., Los Angeles.

ANSWER.—The manifestations reported do not suggest mercury poisoning. Joint pains and diarrhea are sometimes present in mercury poisoning, but not as the most characteristic features. On the other hand, the absence of stomatitis and gingivitis by no means rules out mercury poisoning, since their absence is frequent. Mercurous chloride is so insoluble that neither mercury dermatitis nor systemic involvement often occurs. Trivial absorption through the skin may take place, but absorption from the lungs after inhalation of mercurous chloride dust has been denied. In pharmaceutical houses many thousands of man-days have been devoted to the manipulation of this substance without the causation of mercury poisoning. One large manufacturer reports that over a period of years not a single instance of either mercury dermatitis or systemic poisoning from mercurous chloride has appeared among the workers handling this substance.

Even after intramuscular injection of calomel, as in the treatment of syphilis, absorption is not certain. Andrews states that "the insoluble salts such as calomel are so slowly and irregularly absorbed that their use is attended by hazards of prolonged ineffectiveness due to failure of absorption or prolonged overdosage due to tardy absorption." Directly in contact with the skin, mercurous chloride infrequently causes skin pigmentation, which may be persistent.

It appears to be true that, when mercury poisoning arises from mercurous chloride, in most instances some fortuitous event has led to the transformation to the mercuric state. A wide variety of chemicals effect this change, but such chemicals are not likely to be on hand under the circumstances of the operations mentioned in this query. On a theoretical basis, long exposure of calomel to sunlight may change the state of calomel to mercury bichloride, as may also long continued elutriation.

In this instance mercury poisoning is regarded as improbable from the information furnished, but various steps might be utilized to eliminate uncertainty. Quantitative determination of mercury should be made on both urine and blood. However, such determinations do not represent simple laboratory tests. The quantity of mercury in the atmosphere, should atmospheric mercury be suspected, may be measured through the use of the General Electric mercury detector. Most important of all, thorough clinical examinations should be carried out, following the procedures indicated in United States Public Health Service Bulletin 263, published in 1941 and entitled "Mercurialism and Its Control in the Felt-Hat Industry."

ESTROGENIC HORMONE THERAPY AND CANCER

To the Editor:—Has it been proved that overuse of estrogenic substances might induce cancer? I have been using 1.5 cc. five times monthly of the 10,000 international units. Is this correct or "overuse"?

Louis L. Sherman, M.D., Oakland, Calif.

ANSWER.—Estrogenic substances may induce cancer in animals. There are records of cases in man which suggest that tumor formation has followed estrogenic therapy. However, the true dangers have not been definitely outlined; they have merely been suggested, so that all who use estrogenic therapy should do so with caution. Regarding the prescribed dosage, it is difficult to say whether this represents "overuse" without knowing how long it has been continued and under what conditions. New and Nonofficial Remedies suggests a dosage for estrogenic substances of from 2,000 to 20,000 international units injected one or more times weekly, depending on the response of the patient. After relief has been produced, dosage should be lowered to a maintenance level. Dosage varies for other conditions, such as kraurosis vulvae and gonorrheal vaginitis in children.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 10

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

NOVEMBER 4, 1944

THE RADIOLOGIC ASPECT OF THE UROLOGIC PROBLEM

CHAIRMAN'S ADDRESS

ROBERT A. ARENS, M.D.

Director, X-Ray Department, Michael Reese Hospital
CHICAGO

A decade and a half ago, intravenous or excretory urography was introduced by Swick¹ and von Lichtenberg,² who simultaneously published the results of their investigations with iopax (uroselectan) and its action with reference to the urinary tract in the *Klinische Wochenschrift* in November 1929. This work received confirmation from Heritage and Ward³ early in 1930 in England and was soon further confirmed in this country by a host of investigators. The value of the procedure was quickly recognized, and it was promptly adopted as a routine examination. The usual difficulty of obtaining an adequate source of supply of the necessary drug was rapidly overcome. From an initial dose, intravenously given, of 300 cc. administered by using six 50 cc. syringes or by buret, our chemical confrères shortly were able to develop a satisfactory solution so concentrated that it could be put up in 20 cc. sterile ampules, making the method available to the profession at large. The success of the method depended on the excretion of an iodine fast radical, with the urine, from the kidneys. This made it possible to outline the urinary tract, since the iodine radical gave a density to the excreted urine almost comparable to retrograde pyelographic mediums. At first the iodine content was not sufficient to cast entirely satisfactory shadows, but today, with intravenous solutions available with an iodine content of from 40 to 70 per cent, very satisfactory results are produced.

The method of making this examination is now too well known to warrant a detailed explanation. Let it suffice to say that it is simple and safe if a few precautions are observed. Our standard routine is to start with a scout film or a KUB film. The patient is thoroughly purged the evening before and the intravenous injection is made the following morning, without breakfast. We feel that purging is exceedingly important, for an intestinal tract full of food or feces can well interfere with proper visualization of even large calcific stones in the kidney, ureter or bladder. This was again impressed on us recently when a scout or

survey film, taken just prior to an intended examination, showed a large stone in the left ureter, but because of intestinal contents small stones in the lower calix of each kidney were not visualized. (This patient was not prepared.) Fortunately, since we make it a routine practice never to proceed beyond the scout film examination unless we feel that the entire urinary tract is satisfactorily visualized, these stones were revealed without difficulty in another KUB film after adequate preparation. After a satisfactory scout film has been obtained, our routine consists of roentgenograms made at five, fifteen and thirty minutes. We feel, however, that each case is a law unto itself, and therefore each film is checked, after development, and the routine changed accordingly, if necessary, with exposures made at varying intervals even up to twenty-four hours. Routine is maintained only in cases which are obviously normal.

The method is not without its difficulties and hazards. Severe reactions have been encountered after injection of the medium, with a few fatalities, patients who died apparently as a direct result of the intravenous injection. Pendergrass reported a series of twenty-six deaths out of approximately 661,800 cases, in addition to 11 previously reported. However, an analysis of his survey would indicate that only ten of these twenty-six deaths occurred directly as a result of the procedure. It is true that the other 16 patients had had an excretory urography done, but the statistics would indicate that they undoubtedly died from some other concurrent condition rather than that their deaths were due per se to the method. Pendergrass's figures show that in his series of cases, including the entire 26, only 0.0039 per cent showed a lethal reaction. If one can eliminate sixteen of the deaths classified as delayed, in which there is a question as to the cause of death being the intravenous medium, then the actual figures are exceedingly low, somewhere in the neighborhood of 0.0014 per cent, instead of 0.0039 per cent, as claimed. Other reactions are fairly common, such as flushing, nausea, urticaria, itching, venospasm, pain in the shoulder, sense of constriction in the pharynx, phlebitis and cerebral irritation. Hypersensitivity simulating anaphylactic shock may also be present. It appears, from the literature and from personal contact with radiologists, that the present methods of preexamination sensitivity tests, such as making an intradermal, mouth or conjunctival test, regardless of whether they are negative or positive, are not satisfactory criteria as to whether the patient will or will not react to the application of the drug. It is my understanding that the reactions which have occurred have been due more to extraneous material contained in the glass ampules than to the solutions per se, and this has now been rectified. I agree entirely with the suggestion of Pendergrass that in each room where the urographic study is to be made a tray should

Read before the Section on Radiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.
1. Swick, M.: Darstellung der Niere und Harnwege im Röntgenbild durch intravenöse Einbringung eines neuen Kontraststoffes, des Uroselectans. *Klin. Wochenschr.* 8:2087, 1929.
2. von Lichtenberg, A., and Swick, M.: Klinische Prüfung des Uroselectans. *Klin. Wochenschr.* 8:2089, 1929.
3. Heritage, R., and Ward, R. O.: Excretion Urography. *Brit. M. J.* 1:734, 1930.

be available containing epinephrine 1:1,000, atropine sulfate, caffeine with sodium benzoate and sterile hypodermic syringes for immediate use if necessary. It seems, however, that in the past several years, while reactions more or less severe have occurred, no lethal sequelae have been reported.

The method appears to be a safe one, barring unforeseen allergic or chemical reactions, which might apply to any medication or preparation given intravenously.

Due consideration must be given to contraindications, and extreme care must be employed in using contrast mediums for patients with "severe liver disorders, nephritis, exudative diathesis and severe uremia."⁴ Also the method should be used with caution for patients with pulmonary tuberculosis, hyperthyroidism or hypertension and for patients with a history of allergy.

The usefulness of excretory urography is immediately apparent when one considers the cases in which a study of the urinary tract is indicated but the passage of the cystoscope or of shadowgraph catheters is impossible, contraindicated or undesirable. The value of excretion urography was immediately realized. Here we had a method particularly adaptable in those cases in which we were dealing with pin point ureteral orifices, many times impossible to locate in the bladder, or, having passed a catheter, to meet suddenly an apparent ureteral obstruction, finding it impossible to pass the catheter up into the renal pelvis. Another group of cases which give the urologist difficulty in retrograde pyelography are those of ureteral stricture, a small urethral meatus, prostatic hypertrophy, severe bladder hemorrhage or fistula, in which ureteral catheterization is impossible or contraindicated. Without excretory urography it is almost impossible to determine the presence of certain genitourinary diseases or anomalies in young children and infants. While I feel today that bilateral simultaneous retrograde pyelography is a safe procedure, especially when using the same contrast medium that is injected intravenously, many urologists still hesitate to make this type of examination. Many radiologists still hesitate to make this type of examination and consequently fail to examine the opposite, apparently normal, kidney. It is good, sound practice to visualize the unsuspected kidney whenever possible, but to obtain information relative thereto necessitates a second catheterization, which is not always desirable. Excretory urography may supply this information. In woman, pressure on the bladder by an enlarged uterus due to fibroids, pregnancy or the like, or pressure from altered pelvic adnexa, makes it difficult or impossible to pass a shadowgraph catheter, and here again excretory urography may prove to be a very satisfactory method of determining the status of the urinary tract.

Those conditions which have been well shown in a characteristic manner by excretory urography include the positive findings of pyonephrosis, hydronephrosis, ureteropelvic kinks with obstruction, due to aberrant vessels or adhesions at the ureteropelvic junction, with obstruction anywhere in the ureter, renal tuberculosis, polycystic kidney, traumatic kidney, congenital absence of a kidney, ectopic kidney, neoplasm, horseshoe kidney, double renal pelvis, double ureters, radiolucent calculi in either the kidney, ureter or bladder, ureteral polyp,

hypernephroma, anomalies, carcinoma of the bladder or tuberculosis of the bladder. Excretory urography, however, is not entirely a substitute for retrograde catheterization with pyelography, but there are many occasions on which it elicits certain information obtainable in no other way. Many cases in which cystoscopy and the passage of shadowgraph catheters are contraindicated can be easily handled by the new method, and information can be gleaned that would otherwise be impossible to secure. On the other hand, intravenous pyelography alone is often sufficient and, in addition, gives a good idea of renal function.

An important diagnostic factor, not commonly considered, is the differential diagnosis of shadows in the right upper quadrant, especially between gallstones and renal calculi. These stones often simulate one another in their structure and density. When this occurs, proper rotation films following excretory urography may differentiate one from the other. If there is a gallstone present, it is invariably possible to rotate this shadow entirely out of and away from the kidney contour, thereby definitely ruling it out as a renal calculus.

It is of the utmost importance that the radiologist and the urologist collaborate to the fullest possible degree to obtain the best results from excretory urography. It is only by close team work between the two that the best interests of the patient are conserved, and the closer the liaison the more the value of the procedure. The radiologist should have at his command the history and the laboratory findings and, in the light of these latter, many times he may suggest additional films, under different conditions, the nature of which he has learned through his appreciation of the reaction of normal renal anatomic and gross pathologic conditions of the urinary system, when subjected to the influences of opaque mediums.

SUMMARY

It may be of value to call attention to a few fundamental maxims of urinary tract examination which it might be well to bear in mind:

1. Proper and adequate preparation of the gastrointestinal tract is an essential prerequisite to satisfactory roentgenograms of the urinary tract.

2. An ideal roentgenogram of the urinary tract is one which shows the detail, including the kidney outlines.

3. The kidneys are too often obscured by material in the gastrointestinal tract, which may be so dense as completely to vitiate stone shadows.

4. Failure to visualize a urinary calculus (KUB films) does not signify that a stone may not be present. There are radiolucent calculi that cast no shadow.

5. Even a large calcific ureteral stone may not register a shadow on the film when it lies over the ala of the sacrum. Even large calculi in this location have been missed.

6. A scout film of the urinary tract is usually only the first step in a proper x-ray examination.

7. There is no controversy between excretory urography and retrograde pyelography. Either one or the other, with a scout film, or all three combined, may be necessary before a satisfactory result can be obtained.

8. It is as important to visualize the normal renal pelvis as the pelvis of the suspected kidney.

4. Pendergrass, E. P., Chamberlain, G. W.; Godfrey, E. W., and Burdick, E. D. A Survey of Deaths and Unfavorable Sequelae Following the Administration of Contrast Media, *Am J Roentgenol* 48:754 (Dec.) 1942

9. The use of modern intravenous pyelographic mediums for bilateral simultaneous retrograde pyelography has made the procedure a safe one.

10. A suspect stone shadow, apparently in contact with a shadowgraph catheter, may prove to be outside the ureter or kidney, when rotation films are made.

11. Do not judge stone shadows in the right upper quadrant and within the kidney outline too hastily. They may prove to be gallstones.

12. Lack of excretion (excretory urography) from one kidney does not necessarily mean a "dead kidney." A small stone in the ureter may produce a calculus anuria, even though the stone may not be visualized. It has been noted that renal function has been restored within five minutes after a ureteral calculus has been passed into the bladder.

With reasonable precaution excretory urography, in experienced and competent hands, is a safe and valuable procedure, and one which frequently gives information obtainable in no other way.

2839 Ellis Avenue.

THE MEDICAL DIRECTION OF HUMAN DRIVES IN WAR AND PEACE

MAJOR GENERAL DAVID N. W. GRANT

The Air Surgeon

WASHINGTON, D. C.

The greatest challenge which faces the medical profession today, in my opinion, is the physical and psychologic rehabilitation of the returning war veteran as a member of his community.

Three years ago the medical profession was called on to mobilize its ranks for service in the armed forces. We did so. How well we met that challenge is being demonstrated in the high quality of medical service we are delivering every day on every front. This was a second challenge—the performance of our mission as doctors at war—and we shall continue to accept it and concentrate our energies on war medicine until the last wound is healed.

In the Army Air Forces, however, we have accepted rehabilitation, psychologic as well as physical, as a function of war medicine. Our Convalescent Training Program has proved that this task should begin as soon as the soldier is hospitalized and should continue without interruption until he is able, and knows he is able, to resume a useful life as a soldier or a civilian. Our success in this direction, which places the primary responsibility for rehabilitation within the military organization, has demonstrated that the over-all problem of human reconversion—the task of converting soldiers back to citizens—is not waiting an end of war. They are returning in thousands from the beachheads of Salerno, Anzio, Tarawa, Normandy and Saipan and from the airdromes of England, Italy, Burma and the Pacific. For many of these sick and wounded the war is already over. This current situation may be regarded as a pilot run on the immense rehabilitation project to come when millions of war veterans are restored to civilian environment.

By this I do not mean that millions will be disabled. The physically handicapped will be numerous, too

numerous, unfortunately. The job of physical restoration and mental readjustment of the physically disabled is clearcut. It is being tackled in an organized and effective manner by the Army, the Navy, the Veterans Administration, the American Medical Association and the many civilian and government agencies associated in the Baruch Committee on Physical Medicine.

THE PROBLEM OF REHABILITATION

My point is that, in comparison to those with outright disabilities, a far greater proportion of our returning war veterans will be able bodied but psychologically different from the civilians who left their communities to enter military service two, three or four years before. They have different attitudes, different feelings, different emotions, different drives, and they present a problem of rehabilitation which is complicated and obscure. The nature of their problem is difficult to understand and complex in its solution. While these differences in behavior fall within the field of psychiatry, they do not apply merely to the neuropsychiatric casualty—the case of frank war neurosis, or operational fatigue, as it is known in the AAF. More specifically, I am speaking of the war veteran who would be classed as normal by any ordinary physical or mental standard but whose attitudes and drives have been altered by the impact of war.

From the time he was inducted, this man's foremost desire has been to get home again. He carries it through the rigors of training and the terrors of battle. He is nonetheless loyal and he fights nonetheless well because of his human yearning to go home. But when he goes, when he is again among his relatives and his friends in his home town, he may be engulfed with the feeling that everything is changed, that he somehow has been cheated. He feels disappointed, disillusioned, depressed and dissatisfied. He may be tense and restless and even wish he was back in combat. His lost feeling may express itself in an attitude of resentment and hostility toward the people and the community he loves. He may come to feel more like a victim of these people than their hero.

What has happened to this man is not hard to understand. It has received some public attention, but the story needs to be made a part of a national educational campaign. Such a program must start with the elimination of the widespread misunderstanding which exists in the mind of some physicians as well as the general public as to the significance of terms like "psycho-neurosis" and "neuropsychiatric casualty" and as to the nature of military psychiatry. In the first place, for most of us physicians the methods of psychiatry seem mysterious, esoteric and incomprehensible. Where other medical specialists may see and palpate the hernia by physical examination, find a kidney stone or an ulcer by reading an x-ray film or identify typhoid by a bacteriologic test, the psychiatrist can diagnose a functional disturbance of the central nervous system only by a qualitative analysis of changes in the patient's behavior and personality. While to most of us this interpretation of illness from actions and reactions seems an intangible way of making a medical diagnosis, you will see, if you think about it, that it is a social practice in which we indulge every day. Constantly we are judging one another by the deviations of the subject's conduct from the conventional. We reach glib conclusions that Joe is "a crazy guy" or Jack "acts funny."

But we accept them and maybe even admire them. We excuse the man who has a spell of being crabby, jittery, seclusive, bellicose or eccentric as being somehow different than usual and let it go at that. But if Joe or Jack goes to a psychiatrist we may change our minds, because psychiatrists are commonly identified with the treatment of the mentally disordered and unbalanced, and we think that any one who needs a psychiatrist must be pretty badly off. All of us, of course, have an instinctive distrust and aversion for the insane. Actually, the psychiatrist probably agrees with us that Joe or Jack "acts funny," but he calls it a psychoneurosis or functional nervous disorder, which to him doesn't even imply a psychosis or insanity. But the damage is done because the person is in the hands of a psychiatrist, and Joe or Jack is tagged with a name which the American public has come to think of in terms of weakness.

This impression makes it difficult for the public to believe that soldiers who have been labeled as "NP"—or neuropsychiatric—are no different from other people who get the jitters or become upset in difficult and harassing situations. By any working standard these men were accepted as normal in their communities, which is the environment to which they usually are best adapted. Even those who were rejected for military service at the outset on neuropsychiatric grounds tend to fall within normal standards as far as their civilian environment was concerned. In it they were capable of making good social and occupational adjustments, but in a military environment of discipline, regimentation, insecurity and hardship they did not look like good fits. Outside of the comparatively small group of soldiers who were psychoneurotic or less frequently psychotic but were able to get by the induction examination, the war psychiatrist is dealing with a normal person in an abnormal environment.

This is the message that the physician, the relatives, the friends, the employer and the community of the war veteran should hear. Whether he is labeled a neuropsychiatric casualty or is discharged for some other reason or is merely home on leave, any differences in his behavior probably comprise a hangover from his normal reactions to an abnormal way of living—and dying.

What war has done is to call on this individual to accept the abnormal idea that self preservation is less important than self sacrifice—that there is a distinction between killing a man in peacetime and killing him in war. Conditioned throughout his formative years to seek security and comfort, to love peace and freedom, the raw recruit is quickly and brutally exposed to a system which, first in training and then in combat, subordinates his personal security to that of the group, continually replaces comfort with hardship and strain, offers him peace only as the distant reward for making war, and denies that freedom is preferable to authoritarian discipline and regulation.

It is difficult for the individual to adapt himself to this military deflation of his ego, to this superimposition of the group ego on, and frequently against, his will. All men are alike in that they have feelings and in that these feelings may run into emotional conflict with other feelings which are equally acceptable. In our fliers we have observed a number of basic conflicts. The most obvious is that of the fear of destruction conflicting with the compulsion to fight. The individual's instinct says flee, but the will of the group says fight. There

is the very real conflict between one's sense of duty, or patriotism, and one's worries over one's wife and child. There is the conflict in the desire to stick by your friends in the squadron when your ego tells you to "save yourself." And there are conflicts arising from a feeling that your friend in the ball turret or in the wing position was killed because of some personal failing on your part. One of the most interesting conflicts observed in our fliers has nothing to do with the man's peacetime conditioning but with his complete acceptance of flight as a normal environment. He loves to fly. He is the "natural," and you will hear him say "Doc, I'd rather fly than eat." He means it. The airplane gives him a lift spiritually as well as aerodynamically. To get up there in the sky and look down on the earth inspires in him a sense of majestic freedom, a kinship with the gods. But a conflict arises from his discovery that, as the result of combat flying, the thing he loves seems bent on destroying him.

Can these soldiers who have faced tensions and stresses far beyond any peacetime demand on their organism be regarded as mentally suspect because they carry the anxieties they have developed in combat back home with them? You know the answer is no. They have reacted normally to an essentially inhuman environment and in most cases have made remarkably good adjustments to their military environment up to a point where no man could be expected to endure much more. They are not failures because they may have developed certain symptoms of anxiety. Each man has his individual tolerance point for military stress. The basic soldier, uprooted from the local environment and transplanted in the training camp, may not be able to make the adjustment. The flier, who has made every adjustment from the original load imposed on him in the aviation cadet center throughout the two years it takes him to complete his flight training, in a few instances may not be able to make the final adjustment to combat flying.

But the great majority of them do, and they fly their missions, twenty-five, fifty or more, carrying their anxieties into battle and out again. They are the strong and the successful. But when they have completed their tour of duty and returned to the United States, they bring their differences in behavior with them.

These men have been poured into a mold, the mold of war, and to remove them from it requires adjustments as profound as those they were forced to make when they changed from civilian to military environment. They present all degrees of difficulty in adjusting to the peaceful, prosaic and trivial circumstances of home life after learning to live in a fighting group which so orders their life that it can give all or take all with one word from one commander. One man, flexible, resilient, may come home, take his wife on a fishing trip and settle down to being "good old Bill" again without so much as a harsh word. Things are different, but he can "sweat" anything out. Another highstrung race horse of a man perhaps finds that the releases he found in combat are boiling over in hostility toward his mother's solicitation or in a desire to punch the nose of every civilian he sees on the street.

There will be every gradation in the changes which war has wrought in the behavior of these men, because of the differences in their drives, their conditioning, their physiology and their attitudes. Any man forced to conform to an environment in which he does not fit well develops nervous tension and therefore psycho-

neurotic symptoms. The greater the incompatibility between his personality and the environmental stresses, the greater the tension and the more severe his symptoms. The longer the stresses are continued, the more worn out he becomes from the tension.

The individual's personality can be described as having the characteristics of the curved leaf in a spring, such as found in an automobile. If the spring is forced to conform to a curve either greater or less than that to which it was molded, the spring is under tension. The greater the discrepancy from the natural curve, the greater the tension, and the more the steel is fatigued.

Like the various leaves in the spring, each individual has his own curve and will have to be bent in varying amounts to fit in the curve of tension imposed by combat. If the tension has been sufficient to fatigue his personality, he may be slow to spring back to the shape in which his original environment molded him.

This is the challenge we face each time a war veteran returns home—to see that he has full opportunity to spring back to his original personality curve. Given a little time and a little help, most of them will. The original curve of that spring is strong, and removal of abnormal stress and tension is curative in most cases. But the changes from an environment of tension to one of relaxation is a radical one and, in instances in which the fatigue of the personality has been great, special help must be given in making the adjustment.

What we are dealing with is the problem of fitting individuals into groups—individuals who express themselves in some sort of work—groups designed to produce in some fairly specific manner. Perhaps at first glance this does not seem like a medical problem. In the experience of the Army Air Forces it is. The AAF Medical Service has found a direct relationship between a man's health and the group to which he is assigned. If he is not doing the right job or the group is not doing its job, he tends to become unhappy and inefficient, and these characteristics may be manifested in various breakdowns in his health. If after breaking down he is not reoriented as a member of a productive group his recovery is slow and perhaps incomplete.

COMBAT FLYING

In dealing with the highly specialized occupation of combat flying, we have developed a program in aviation medicine which I feel introduces a new concept in medical practice or at least brings previously unrelated branches of science into a medical focus.

Our first interest in the flier is the matter of selection. Each candidate must have the physical capacity. The medical examination for flying performed by the flight surgeon emphasizes not only general mental and physical fitness but also normal function in vision, hearing, equilibrium and personality. Each man must also have the psychologic aptitude for learning to fly. Our aviation psychologists have developed the most comprehensive mass psychologic testing program in history—all for the purpose of fitting the individual into the occupational group where he has the greatest chance of succeeding. This wartime demonstration indicates that an entire industry or even an entire nation could make progress by determining an individual's physical capacity and psychologic aptitudes and then training him for the task for which he is best fitted.

Our second interest in the flier is the preservation of his physical and psychologic fitness to fly. A flight surgeon is assigned to each squadron. The flight surgeon, through his participation in the working environment of his patients, occupies a position which is rather unique in medicine, although it has some precedent both in the country doctor, who was a power in his community, and in the industrial surgeon, who is interested in occupational diseases and hazards. One of the flight surgeon's main interests is the prevention of operational fatigue, the occupational disease of the flier. The syndrome of operational fatigue, made up of a composite of emotional and fatigue symptoms, is a product of chronic tension and physical tiredness manifesting itself in a state of anxiety. It is a destroyer of individual efficiency and laterally group morale. Any contribution to morale aids in the prevention of operational fatigue, and nothing contributes more to morale than good leadership. The fitness of the individual for his job depends on physical capacity and psychologic aptitude, but the fitness of a group of fit individuals depends more than anything else on the intelligence manifested by the leadership in directing the group toward the logical utilization of its abilities. It has been one of the most profound observations of the war, I think, that not only the efficiency but also the health of a group is affected by the quality of leadership. Medical officers have observed both in the Air Corps and in the Infantry that weak leadership is reflected in a high neuropsychiatric casualty rate and strong leadership in a low rate. Thus you see that treating the sick individual is secondary to the function of treating the healthy group so that its members will not become sick.

Our final interest in the flier is the restoration of his physical capacity and psychologic aptitude for productive work after he has become sick. This is the function of the AAF Convalescent Training Program. We operate five convalescent hospitals where the flier returning from combat with a physical disability or with operational fatigue may be given the special attention needed for his rehabilitation. The first objective is to salvage him for further military service for he, after all, is the man who was a success and not a failure in his military occupation. If it is not possible to rehabilitate him for resumption of flying duty, an attempt is made to retrain him for ground duty. Only as a last resort is he discharged back to civilian life. If this is necessary, every effort is made to prepare him for this change of environment.

Convalescent training is fourfold in its approach. It aims at physical reconditioning, psychiatric restoration, vocational reorientation and resocialization. If it's a job the man is worrying about, we help him find a job to his liking. If he has a family problem, we try to work it out with his wife. In fact, because of the husband-wife problems rising out of changes in the patient's behavior we have established orientation courses for wives of returning war veterans.

As an example of what can be done if the group makes an effort to rehabilitate its own members, I will cite results obtained at one of our convalescent hospitals in a series of cases of severe operational fatigue. By severe I mean that these individuals returned from successful completion of their combat tours with such symptoms as restlessness, tension, tremor, overactivity of the sympathetic nervous sys-

tem, psychosomatic disturbances, anxiety states, phobias, depression, guilt reactions, inability to concentrate, mental confusion, weight loss, insomnia, battle dreams, irritability, startle reactions, loss of appetite or aggressive impulses. All were in need of psychiatric treatment in addition to rest, physical reconditioning and general reorientation. The results among officer flying personnel was restoration of 61 per cent to full flying duty, 8 per cent to limited flying duty and 27 per cent to ground duty. This made a total of 96 per cent rehabilitated in military service. Owing to less incentive, the full flying duty restorations among the enlisted flying personnel were much lower: 28 per cent. An additional 6 per cent were restored to limited flying duty and 48 per cent sent back to ground duty, making a total of 82 per cent rehabilitated in military service.

In considering these results it should be noted that in a psychiatric case the individual's desires are an important factor in deciding whether he should fly again or not. The fact that two thirds of the flying officers and one third of the enlisted men who had suffered severely from the stresses of their combat environment are willing to go back is significant of the potentialities of a medical approach based on the relation of the individual's capacities and aptitudes to the occupational group. After all, these men had made their sacrifice, and it might be expected that none of them would care to return to an environment which had caused them distress. I believe that a great many of our fliers, once the end of the war has relieved them from the abnormal tensions of combat, will realize that they are completely conditioned to a flying environment. They will then be normal men in normal environments.

REDIRECTION OF ENERGIES FROM WAR TO PEACE

As for the rest, we have directed the drives of these war veterans into winning a war and now face the responsibility of redirecting their energies into peace. You may feel that this war veteran is the problem of somebody else—of the psychiatrist, the psychologist, the sociologist. He is, indeed, their problem, but he is everybody's problem—the problem of his government, his community, his employer, his relatives, his friends and his doctor. No one should be better qualified by reason of scientific training and humanitarian interest than the physician to give direction to a national program which will redirect the drives of these men into socially constructive, individually satisfying channels.

The medical profession, I am convinced, has a profound opportunity stemming from the task of reorienting these men in their group. This is the development of a new type of preventive medicine seeking to improve the individual's health and efficiency by his orientation in an intelligently directed group in which he has the aptitude and desire to work. In this field, which we may for the moment call industrial community medicine, lies the challenge of transplanting to the soil of civilian industry some of the constructive discoveries we have made in the prosecution of a technological war.

In reality, the family doctor now becomes the specialist, and strangely enough his specialty has already been defined in medical terminology. He is a specialist in orthergasia, which literally means the conditioning of man to normal function and adjustment.

Headquarters, Army Air Forces.

PENICILLIN IN OPHTHALMOLOGY

LIEUTENANT COLONEL JOHN E. L. KEYES
MEDICAL CORPS, ARMY OF THE UNITED STATES

After the accidental discovery by Fleming¹ in 1929 of the inhibitive effect of penicillium mold on staphylococci in vitro, no effort was made to apply this knowledge in a clinical way until the studies begun by Howard W. Florey and his co-workers in 1940. Since then the organic acid formed by *Penicillium notatum* and named penicillin has been extensively investigated.

Observations on the use of penicillin in the treatment of ocular diseases in man have been published by Abraham,² the Floreys,³ Keefer,⁴ Mary Florey,⁵ Keyes,⁶ Sorsby,⁷ Lyons,⁸ Griffey⁹ and Cashell.¹⁰

Material for this communication was derived from the special penicillin research center at Bushnell General Hospital, from private communications of medical officers of the Army and from medical literature on penicillin. No effort was made to compile statistics by treating a number of similar cases with penicillin. Research, which was essentially clinical, was directed toward establishing the sphere of usefulness of penicillin as an ophthalmic drug. The information presented in this report is tentative and subject to modification as our knowledge of penicillin increases.

More than 20 bacteria clinically sensitive to penicillin have been described. The following penicillin sensitive pathogens are encountered in ocular diseases: *Streptococcus alpha*, *beta* and *gamma*, *Staphylococcus aureus* and *albus*, *Neisseria gonorrhoeae*, *Neisseria intracellularis meningitidis*, *Neisseria catarrhalis*, *Pneumococcus*, *Corynebacterium diphtheriae (mitis)*, *Clostridium welchi*, *Actinomyces bovis*, *Treponema pallidum* and diphtheroids. Grouped according to penicillin sensitivity, the most highly sensitive organisms are the (beta) hemolytic streptococci, gonococci and some strains of staphylococci. *Streptococcus viridans (alpha)*, *Streptococcus anhemolyticus (gamma)* and the remaining organisms named are less sensitive. *Staphylococci* vary from extreme sensitivity to extreme resistance. Resistant strains are frequently found in skin and superficial wounds. Coagulase positive staphylococci are presumed pathogenic.

It has been observed by Walker¹¹ in mixed infections, in which organisms resistant to penicillin are

From the Surgical Service, Eye, Ear, Nose and Throat Section, Bushnell General Hospital.

Read in a symposium on "The Use of Penicillin in the Treatment of Diseases of the Eye, Ear, Nose and Throat" before the joint meeting of the Section on Otorhinolaryngology and Rhinology and the Section on Laryngology, Otolaryngology and Rhinology, Annual Session of the American Medical Association, June 1944.

1. Fleming, J. H.: Action of Cultures of a Penicillium in the Isolation of B. (June) 1929.

2. Abraham, E. P.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatler, N. G.; Hennings, M. A., and Florey, H. W.: Further Observations on Penicillin, *Lancet* 2: 177 (Aug. 16) 1941.

3. Florey, M. E., and Florey, H. W.: General and Local Administration of Penicillin, *Lancet* 1: 387 (March 27) 1943.

4. Keefer, C. S.; Blake, F. G.; Marshall, E. K., Jr.; Lockwood, J. S., and Wood, W. B., Jr.: Penicillin in the Treatment of Infections: A Report of Five Hundred Cases, *J. A. M. A.* 122: 1217 (Aug. 28) 1943.

5. Florey, Mary: Penicillin, *Brit. M. J.* 2: 656 (Nov. 20) 1943; *Lancet* 2: 639 (Nov. 20) 1943.

6. Keyes, J. E. L.: Recent Advances in Clinical Ophthalmology, *Ohio State M. J.* 39: 1110 (Dec.) 1943.

7. Sorsby, A.: Ophthalmia Neonatorum, *Brit. M. J.* 2: 723 (Dec. 4) 1943.

8. Lyons, C.: Penicillin Therapy of Surgical Infections in the U. S. Army: A Report, *J. A. M. A.* 123: 1007 (Dec. 18) 1943.

9. Griffey, W. P.: Penicillin in the Treatment of Gonorrheal Conjunctivitis: Report of a Case, *Arch. Ophth.* 31: 162 (Feb.) 1944.

10. Cashell, G. T. W.: Treatment of Ocular Infections with Penicillin, *Brit. M. J.* 1: 420 (March 25) 1944.

11. Walker, J. M.: Personal communication to the author.

present with organisms sensitive to penicillin, that the destruction of the sensitive bacteria by penicillin aided in the healing process if the sensitive bacteria were virulent pathogens. If the resistant bacteria were responsible for the virulence of the infection, penicillin therapy was less beneficial.

APPRAISAL OF PENICILLIN

Great care has to be exercised in appraising the efficacy of penicillin in a given ocular infection. The unavoidable error of clinical observation is high. Many ocular diseases are self limiting. Any therapeutic agent employed in such a disease may be credited erroneously with expediting recovery or causing a cure. Two illustrative cases are described:

A case of acute bilateral conjunctivitis secondary to nonhemolytic *Staphylococcus albus* and Koch-Weeks bacillus was treated by instillations of penicillin 1,000 units per cubic centimeter in one eye and 3 per cent solution of sodium sulfathiazole in the second eye. Negative cultures and a clinical cure were obtained in seven days. The staphylococcus was sensitive to both drugs; the Koch-Weeks bacillus was resistant to both drugs. A second case of bilateral acute conjunctivitis secondary to hemolytic *Staphylococcus albus*, coagulase negative, was treated in a similar manner. Conjunctival cultures were negative in four days, and clinical recovery was achieved in nine days. The result in these 2 cases of acute conjunctivitis offered little choice between the use of penicillin and of sodium sulfathiazole. Both patients were hospitalized. Sodium sulfathiazole probably would have been the drug of choice in office practice.

Penicillin is the drug of choice in the treatment of gonorrheal ophthalmia. The Floreys³ had startling success with penicillin in a case of gonococcal ophthalmia neonatorum. "The gonococcal case of ophthalmia neonatorum had shown no response to three and a half weeks' sulfapyridine and irrigation. The discharge was profuse even under quarter hourly irrigations. Penicillin (1,200 units per cubic centimeter) was dropped into the eye hourly. In twelve hours the pus had much diminished and in two days it had gone; the eyes were open and the conjunctivae white. No gonococci were seen in films made eight days later, after penicillin had been discontinued for forty-eight hours. No recurrence was reported." Sorsby⁷ and his co-workers reported that they had cleared the conjunctiva in thirty-six hours with penicillin therapy of gonococcal ophthalmia neonatorum. Griffey⁹ successfully treated a man aged 24 suffering from sulfonamide resistant gonorrheal ophthalmia and gonorrheal urethritis of forty-six days' duration. "Therapy consisted of intramuscular injections of 25,000 units of penicillin sodium every three hours for a total of ten injections." Cultures of *Neisseria gonorrhoeae* were grown from the eyes and the urine. Similar cultures taken after five and one-half hours' treatment were negative for gonococci. Local therapy was confined to atropine as a mydriatic. Final vision was normal bilaterally.

These results contrast favorably with those reported by Sorsby and Hoffa.¹² They treated 60 cases of gonorrheal ophthalmia in children with sulfonamides and reported a clinical cure in three days in 51.7 per cent of

the cases and in eight days in 90 per cent of the cases. Sulfapyridine, sulfathiazole, sulfamezathine and sulfadiazine were given internally. These results were unusually good previous to the advent of penicillin therapy.

Penicillin should be given preference also in the treatment of streptococcal and sensitive staphylococcal infections. Some strains of staphylococci are resistant to penicillin. Cross infection is a frequent occurrence. If the new organism is not sensitive to penicillin and assumes virulence, the progress of penicillin therapy will be altered unfavorably. Walker¹¹ is of the opinion that loss of virulence under treatment by a strain of staphylococci resistant to penicillin is problematic. Several chronic orthopedic cases were treated for three different periods with rest intervals. The bacteria did not become penicillin fast. He encountered one organism that became resistant under treatment.

A case of resistant *Staphylococcus aureus* infection is reported briefly:

A soldier with chronic ulcerative blepharitis, subacute conjunctivitis and pyoderma of his face was found to have hemolytic *Staphylococcus aureus*, coagulase positive, in cultures from lesions of the conjunctivas, eyelids and face. A solution of sodium penicillin, 1,000 Oxford units per cubic centimeter of isotonic solution of sodium chloride, was instilled into both eyes every two hours for thirty days. During this period of treatment the right eye on one occasion and the left eye on two occasions, coincidental with a temporary increase in the facial infection, became acutely red and superficial marginal ulcers of the cornea developed. It was discovered that this strain of staphylococci was resistant to penicillin in concentrations of 10,000 units per cubic centimeter on a seeded nutrient agar plate. The organism was mildly sensitive to sodium sulfathiazole in 3 and 5 per cent solutions in vitro. The strength of the penicillin drops was increased to 10,000 Oxford units. The patient complained of considerable local irritation, and at the end of thirty-six hours withdrawal of the treatment was contemplated. The brand of penicillin was changed, and further treatment was well borne. Penicillin 10,000 units per cubic centimeter was continued every two hours for seven days. At this time conjunctival cultures from the right eye showed nine colonies of hemolytic *Staphylococcus aureus*, coagulase negative, and from the left eye diphtheroid organisms. Cultures from both eyes were sterile four days later. The blepharitis had disappeared. The lower palpebral conjunctiva was mildly congested. The facial pyoderma, which had not been treated, was quiescent. The patient was referred to a dermatologist for treatment of his skin.

One month previous to treatment of his blepharoconjunctivitis, this patient was treated with penicillin parenterally for a left mastoid infection, from which were cultured a beta hemolytic streptococcus and a nonhemolytic *Staphylococcus albus*.

The possibility of desensitization of the strain of staphylococci found in the eyelids and conjunctiva by previous penicillin therapy has to be considered, even though staphylococci were not demonstrated in the mastoid. The prolonged exposure of the nonsensitive pathogen to penicillin may have reduced its virulence, but remissions occur in this disease.

The treatment of meningococcal conjunctivitis with sulfonamide compounds, both locally and orally, has been favorably reported by Theodore and Kost.¹³ Eight patients with this disease so treated were clinically and bacteriologically cured in not more than

12. Sorsby, A., and Hoffa, Elizabeth L. The Sulfonamides in Ophthalmia Neonatorum, Brit. M. J. 1: 353 (March 11) 1944.

13. Theodore, F. H., and Kost, P. F. Meningococcal Conjunctivitis, Arch. Ophth. 31: 245 (March) 1944.

five days each. Local application of penicillin could not offer much improvement on this record. Penicillin administered parenterally is not secreted in the tears or cerebrospinal fluid; therefore this method of treatment would not be applicable.

The toxin of diphtheria is not neutralized by penicillin. Diphtheria antitoxin should be administered also in the treatment of diphtheritic conjunctivitis. Penicillin is an auxiliary to other known methods of treatment of gas gangrene. Walker¹² reported gratifying success in several cases of actinomycosis with parenteral administration of penicillin. Mahoney¹⁴ and Bloomfield¹⁵ have reported sensitivity of *Treponema pallidum* to penicillin. Riba¹⁶ confirmed their results with penicillin parenterally and intrathecally in cases of early syphilis and neurosyphilis. Diphtheroid organisms are seldom virulent. They are susceptible to local penicillin therapy.

ILLUSTRATIVE CASE REFERENCES

Ulcerative Keratitis.—Local and systemic penicillin therapy is indicated in acute, severe ulcerative keratitis in the presence of a sensitive organism. In chronic indolent corneal ulcerations, local penicillin therapy should be given a trial. Penicillin sometimes has a beneficial effect and hastens the termination of prolonged stubborn corneal ulcerations. Two illustrative cases are summarized briefly:

A white soldier aged 21 acquired an ulcerative keratitis of his left eye in March 1943 secondary to unidentified trauma. There was a diffuse central corneal opacity which stained widely

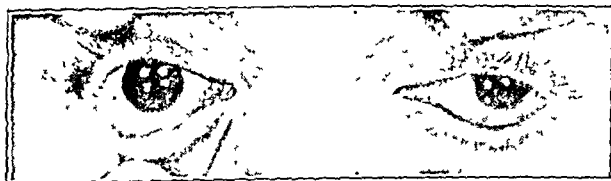


Fig. 1—Chronic ulcerative blepharitis, subacute conjunctivitis and pyoderma of the face, secondary to coagulase positive hemolytic *Staphylococcus aureus*. The organism was resistant to penicillin 10,000 units per cubic centimeter *in vitro*. The photograph was taken at the beginning of treatment.

with fluorescein on April 29, 1943. The eye was red and painful. The corneal ulceration progressed. Photophobia, lacrimation, headache and ocular pain were constant. The corneal epithelium would not regenerate. Conjunctival cultures showed the presence of a gram negative bacillus and a gram positive bacillus, unidentified. Vision was reduced to hand movements. Enucleation of the eye was seriously considered. Instillation of penicillin, 250 units per cubic centimeter, 3 drops in the left eye every fifteen minutes for two hours and thereafter every half hour, was begun on May 25. On June 4 dosage frequency was reduced to every three hours between 7 p. m. and 9 p. m. Penicillin therapy was discontinued on June 19. Twenty-four hours after treatment was instituted there was definite clinical improvement. The ciliary flush had diminished and the crater of the corneal ulcer was smaller. Forty-eight hours after treatment pain had diminished to such an extent that the patient stated he felt more comfortable than he had felt for a long time. The corneal ulcer slowly healed, forming a vascularized interstitial scar. The conjunctival cultures grew many organisms. *Staphylococcus albus*, gram positive and gram negative bacilli, diphtheroids and spore bearing bacilli were noted. There was still slight staining of the cornea on June 9. On June 16 the left eye was white, the patient was symptom

free and the cornea did not stain. Vision of the left eye was ability to count fingers at a distance of 1 foot. A relapse did not occur. It is reasonably certain that this eye was saved by penicillin therapy.

An officer aged 28 suffered a chemical burn of both eyes and eyelids on December 8, 1943. The left eye healed with minimal corneal opacities and vision of 20/30—2. The right



Fig. 2—Patient illustrated in figure 1 one month after local treatment with penicillin 1,000 units per cubic centimeter. His blepharoconjunctivitis has improved considerably. *Staphylococcus aureus* is still present. The facial infection was not treated.

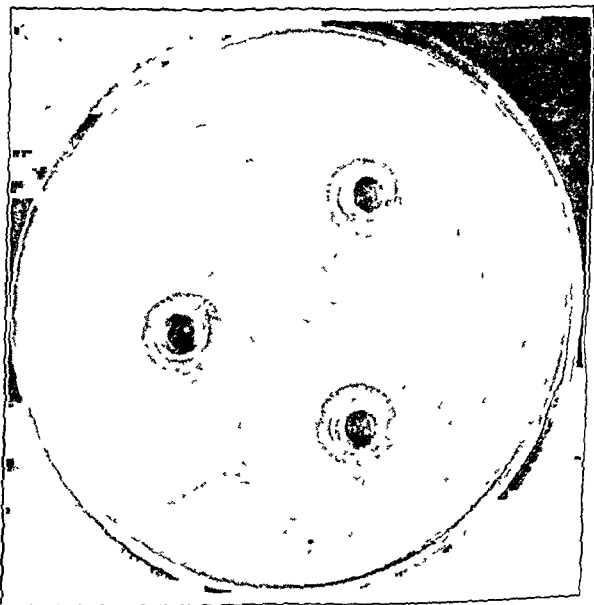


Fig. 3—Nutrient agar cup plate seeded with *Staphylococcus aureus* in the same case as figures 1 and 2. The cups contained a solution of penicillin 10,000 units per cubic centimeter. The inhibition rings are minimal. Growth would have been inhibited on most of the plate with a sensitive organism.

14 Mahoney, I. F.; Arnold, R. C., and Harris, A. Penicillin Treatment of Early Syphilis: A Preliminary Report, *Am. J. Pub. Health* 33: 1387 (Dec.) 1943.

15 Bloomfield, A. L.; Rantz, L. A., and Kirby, W. M. M. The Clinical Use of Penicillin, *J. A. M. A.* 124: 627 (March 4) 1944.

16 Riba, L. W.. Personal communication to the author.

cornea remained insensitive, with a low grade superficial ulceration, great photophobia and profuse lacrimation. A hordeolum appeared on the lower left eyelid on Feb. 29, 1944. Conjunctival

cultures revealed the presence of nonhemolytic *Staphylococcus aureus*, coagulase positive, and nonhemolytic *Staphylococcus albus*, coagulase negative. Local penicillin therapy was instituted to prevent infection of the cornea. Three drops of sodium penicillin 1,000 units per cubic centimeter was instilled hourly in the right eye. Treatment was discontinued on March 5. The hordeolum was incised and healed rapidly. The cornea did not become infected. Sensation returned to the cornea during penicillin therapy. A small indolent superficial ulcer was still present when penicillin was discontinued. The corneal ulcer did not heal, and symptoms of irritation remained. On March 17 *Staphylococcus aureus*, coagulase negative, was cultured from the conjunctiva. There was evidence of an acute pharyngitis and cervical adenitis. Local penicillin therapy was resumed every two hours. Atropine mydriasis was maintained. Treatment was discontinued on April 4, at which time the right cornea did not stain. Photophobia and lacrimation had diminished greatly. His right eye was more comfortable than it had been for weeks. Conjunctival cultures were negative. The right cornea stained slightly on two occasions after penicillin was discontinued. Vision was 20/30—2 in each eye on May 13.

This case illustrates the advisability of obtaining and maintaining a sterile conjunctiva in the presence of chronic corneal disease. Penicillin therapy was apparently discontinued too soon in the first instance. No other medication afforded such prompt objective and subjective relief.

Keratitis Dendritica.—Two patients with monocular keratitis dendritica, recurrent in scarred corneas, were treated with penicillin locally and scopolamine mydriasis, without closing the eyes. Penicillin 1,000 units per cubic centimeter every two hours was used in both cases. Cultures in the first case were sterile. At the end of twenty days of treatment there still remained a small staining area on the cornea. A cross infection by a gram negative bacillus resembling the Koch-Weeks or influenza bacillus occurred. The remaining ulceration of the cornea was treated twice by topical application of 95 per cent alcohol, after which final healing was obtained. The second patient was infected with hemolytic *Staphylococcus aureus* and an unidentified gram negative bacillus. Penicillin therapy was terminated after twenty-three days by a relapse of malarial fever. At this time there remained a small staining area on the cornea. The cornea healed immediately after subsidence of the malarial attack. Conjunctival cultures were sterile after seven days' therapy. This patient has since relapsed. The presence of a nonhemolytic *Staphylococcus albus*, coagulase negative, was demonstrated. The ulceration progressed under topical applications of alcohol. Penicillin therapy was resumed. A minimal staining area finally healed when the eye was patched. Subjective symptoms were minimal in both patients, although the pupil of the diseased eye was dilated and the eyes were unpatched. No increase occurred in previous corneal scarring. The value of the penicillin therapy was problematic. The element of the curative advantage of hospitalization cannot be overlooked.

Chronic Blepharoconjunctivitis.—Several patients were treated locally with penicillin solution alone and combined with penicillin ointment. A staphylococcus was the chief infective agent in most instances. The majority of these patients responded promptly to treatment. A few relapses occurred. The patients were

treated again with penicillin locally, with good results. One instance of complete resistance to penicillin was encountered. It is doubtful that penicillin will cure noninfected allergic conjunctivitis.

Orbital Cellulitis.—Several cases of orbital cellulitis were seen in consultation with the ear, nose and throat section. Early and large doses of penicillin parenterally gave satisfactory results when the causative agent was sensitive to penicillin. Unless orbital cellulitis and cavernous sinus thrombosis are seen early and react favorably to heroic treatment with penicillin, surgical intervention is required also. A more detailed report of this type of disease belongs to the ear, nose and throat practitioner.

Trachoma.—Unsatisfactory results were obtained in 1 case of bilateral trachoma, secondary stage, treated with penicillin 1,000 units per cubic centimeter locally every two hours for nine days. The disease progressed during treatment. Expression of the follicles with Knapp's roller forceps followed by local and systemic sulfonamide therapy brought immediate improvement.

Penetrating Injuries.—The studies of von Sallmann and Meyer¹⁷ suggest the inadequacy of local treatment by instillation of penicillin drops on the cornea and in the lower conjunctival cul-de-sac in the treatment of experimental acute suppurative intraocular infections in rabbits. It is recommended until further clinical and experimental evidence is available that the technic of Cashell¹⁸ and Grant¹⁸ be followed in treating injured eyes. They instilled penicillin directly into the anterior chamber, with favorable results.

Cashell¹⁸ "irrigated" the anterior chamber in 2 cases of perforating injury. The end results were good. A postoperative infected cataract, treated for thirty-three days, was included in this group. In 3 other cases "definite infections of the anterior chamber cleared with penicillin, but chronic cyclitis supervened." These eyes were excised.

Grant¹⁸ reported striking improvement in an eye suffering from exudative iridocyclitis secondary to a penetrating wound and treated with penicillin thirty-four days after injury. Aqueous, 0.25 cc., was withdrawn from the anterior chamber through a hollow needle and replaced by an equal amount of penicillin solution 250 units per cubic centimeter. Forty-eight hours later recovery had begun and marked the turning point in saving the eye. Further penicillin treatment was not required.

Adequate penicillin treatment of an infected perforating eye injury or a metastatic eye infection entails combined parenteral, local and intraocular medication. Continuous intravenous drip of 200,000 Oxford units in twenty-four hours or in less acute cases intramuscular injection of 25,000 units at three hour intervals is recommended. Local therapy may consist of instillation of penicillin 1,000 units per cubic centimeter half-hourly or hourly, supported by the withdrawal of aqueous and replacement by penicillin 1,000 units per cubic centimeter of isotonic solution of sodium chloride. The withdrawal of aqueous when a high level of penicillin in the blood has been obtained should give a maximum secretion of penicillin in the secondary

17. von Sallmann, L., and Meyer, K.: Penetration of Penicillin into the Eye, *Arch. Ophthalm.* 31:1 (Jan.) 1944.

18. Grant, R. B., Jr.: Personal communication to the author.

aqueous, if such secretion occurs. It is doubtful that more than 0.4 cc. of aqueous can be replaced by penicillin. The removal of penicillin from the anterior chamber by natural filtration and dilution by the remaining aqueous and the secondary aqueous would give a primary dilution of not more than 200 units per cubic centimeter of aqueous with further rapid dilution. The effective level of penicillin in the aqueous and the rapidity with which this level is reduced by normal drainage have not been ascertained.

Prophylaxis in Eye Injuries.—The use of penicillin as a prophylactic measure in eye injuries is a justifiable empirical measure. Other therapeutics also should be employed.

An aviator aged 21, who suffered a contusion of his left eyeball, presented an instance of such therapy. The cornea was abraded. There was a hyphema. Vision was reduced to 5/100. Conjunctival cultures revealed hemolytic *Staphylococcus albus*, coagulase positive. Four days after injury, treatment was started with penicillin 15,000 Oxford units intravenously every three hours and 3 drops of 1,000 units of penicillin per cubic centimeter of isotonic solution of sodium chloride instilled in the left eye half-hourly for eight doses and then hourly. Treatment was continued for six and a half days. The pupil was dilated and a small posterior synechia broken by scopolamine. A diffuse deep interstitial haze developed on the temporal side of the left cornea concurrent with increased hemorrhage in the anterior chamber. The eye culture was negative in one day. On completion of penicillin therapy the corneal haze was reduced to a small linear peripheral scar. The vision in the left eye was 20/20 slowly. The interior of the eye was normal.

This officer presented a therapeutic problem. His training was within one month of completion. There was clinical evidence of severe trauma to his left eye. A pathogenic organism was present in the conjunctival cul-de-sac of his injured eye. This eye manifested a severe inflammatory reaction involving the conjunctiva, episclera, sclera, cornea and iris. There was a choice of therapy between artificial hyperpyrexia and penicillin. Penicillin was chosen because of the presence of a hemolytic *Staphylococcus albus*, coagulase positive.

Recurrent Post-Traumatic Iritis.—The history of an injured soldier with iritis was enlightening:

A white soldier aged 20 was injured by a dynamite explosion in November 1943. On Feb. 29, 1944 he reported with iritis of his left eye. Examination revealed bilateral corneal scars and traumatic cataracts. There was evidence of previous iritis of his right eye. Sand had perforated his left eye. Conjunctival cultures were sterile. Penicillin was administered intramuscularly, 25,000 units every three hours for four and a half days and reduced to 15,000 units for two days. Mydriasis by atropine was maintained. Recovery was prompt. No sequelae remained. A slightly discharging left amputation stump was not affected by penicillin therapy. On March 20 iritis recurred in his left eye. Treatment of this attack of iritis consisted in keeping the pupil dilated with scopolamine for six days. An aqueous flare, which was present in both attacks, had then disappeared. The blood vessels of the iris were still slightly engorged. Ocular pain disappeared after twenty-four hours of treatment in both attacks of iritis.

This patient exemplified the difficulty of clinical research. It is doubtful that penicillin was of any benefit in this case.

MEDICATION AND DOSAGE

The following routes of administration are applicable in eye diseases:

Local.—Instillation in the eye: Dosage 250 to 10,000 Oxford units dissolved in 1 cc. of isotonic solution of

sodium chloride or distilled water, pH 7.7, administered hourly in acute conditions, every two hours in subacute conditions and not less frequently than every three hours. Cashell¹⁹ reported good local results with less frequent and weaker dosage. He did not report any penicillin fast organisms developing during treatment. Fresh solutions kept in a commercial refrigerator deteriorate very slowly. It has been the practice to replace eye solutions, kept at room temperature, after forty-eight hours. The solutions are still potent in vitro.

Ophthalmic ointment: Dosage 250 to 500 units incorporated in a gram of ointment base. Commercial petrolatum or hydrous wool fat, 25 per cent combined with cold cream 75 per cent showed a satisfactory zone of diffusion of penicillin in vitro on seeded plates. Penicillin ointment still showed appreciable penicillin activity after six months in a commercial refrigerator. Diffusion activity lessens appreciably after twenty-five days at room temperature. One specimen was still potent after forty-five days at room temperature.

Intraocular: Aqueous is withdrawn from the anterior chamber through a needle and replaced by penicillin. Local or general anesthesia is employed. Incomplete incision of the cornea at the site of puncture simplifies passage of the needle. Freshly prepared penicillin 500 to 1,000 units per cubic centimeter of isotonic solution of sodium chloride is used. Aqueous to the extent of approximately 0.4 cc. may be withdrawn with impunity. The strength of the injected penicillin is immediately reduced by the remaining aqueous and is soon further reduced by removal by normal filtration and dilution by new aqueous.

Parenteral.—**Intramuscular:** Dosage from 15,000 to 25,000 units in isotonic solution of sodium chloride or fractionally distilled pyrogen free distilled water injected into the thigh, gluteal or upper back muscles every three hours.

Intravenous: Intravenous solutions are made daily. Pyrogen free isotonic solution of sodium chloride and 5 per cent dextrose are used as solvents. Intermitent dosage 15,000 to 25,000 units injected slowly every three hours. Continuous drip dosage 200,000 units of fresh penicillin dissolved in 2,000 cc. (2 liters) of saline or dextrose solution administered in twenty-four hours at a basic drip rate of approximately 30 drops per minute. Treatment may continue for several days. Larger doses have been given without ill effect. A dextrose solution is recommended in the presence of kidney disease to avoid possible anasarca.

Intrathecal: Riba¹⁶ has found the administration of 25,000 units in 2.5 cc. of isotonic solution of sodium chloride by replacing an equal amount of spinal fluid very satisfactory. The medication is repeated at forty-eight hour intervals or oftener in acute disease. Penicillin accumulates in the spinal fluid.

Staphylococcal infections require three or four times as much penicillin as streptococcal infections. Queen¹⁹ has found the minimum effective blood level for the staphylococcus 0.3 unit per cubic centimeter of circulating blood. A concentration of 0.03 unit per cubic centimeter is sufficient for streptococcal infections. It has been the practice to continue reduced treatment for two or three days after a clinical cure has been obtained.

19. Queen, F. B. Personal communication to the author.

Penicillin may be discontinued sooner in acute infections than in chronic infections without fear of relapse. Penicillin is thermolabile. A p_H of 7 to 7.7 is recommended for solutions and ointments. Penicillin stock solutions should be refrigerated.

COMPLICATIONS

Most complications, such as phlebitis, pyrexia, pain at the site of injection, vascular and sympathetic disturbances and muscular cramps, have largely disappeared with the use of purer penicillin.

Generalized allergy with urticarial manifestations, with or without fever, has occurred. Thrombophlebitis may occur at the site of prolonged intravenous injection. Local allergy of a mild degree affecting the eyelids and skin below the eyes is easily controlled by covering the eyelids and skin with a neutral waterproof emollient.

An unusually severe allergic reaction was obtained, in 1 instance following instillation of 4 drops of sodium penicillin 1,000 units per cubic centimeter into both eyes at hourly intervals. There was evidence of redness and puffiness of the eyelids before the last drop was administered. The eyelids then became very red, hot and nearly closed by edema. The conjunctiva was acutely congested. The mucous membrane of the nose and throat was red, dry, painful and glossy. A temperature of slightly more than 100 F. was carried for four days. The patient complained of malaise similar to that noted after an inoculation with antityphoid vaccine. He was hospitalized for a week. The penicillin used in this case was tested on another patient and on a rabbit with negative results. A skin patch test elicited a negative reaction. Cutaneous disturbances had been experienced by the patient on ingestion of certain sea foods, chocolate, strawberries and rice.

The complication of cross mixed infection in ocular diseases is not so important as in general infections but may retard recovery. There is evidence suggesting that with the extermination of a virulent penicillin sensitive organism present in a given case the remaining nonsensitive organisms are not very pathogenic.

Local irritation caused by the early batches of penicillin has disappeared with purification of the drug.

Inadequate early treatment with penicillin may cause reduction of sensitivity of the organism treated or even penicillin fastness. In such cases intensive treatment with penicillin may be tried with some prospect of obtaining clinical improvement with lessened virulence of the organism. The combined or alternate use of sulfonamide drugs should be tried.

The criteria of successful penicillin therapy are speedy relief of a patient's symptoms and rapid subsidence of infection.

COMMENT

Penicillin is the drug of choice in the treatment of ophthalmic diseases secondary to infection with gonococci, streptococci and sensitive staphylococci. Penicillin should be given a trial in the treatment of diseases caused by *N. meningitidis*, *N. catarrhalis* and pneumococci. The use of penicillin is optional in the treatment of infections caused by *C. diphtheriae*, *Cl. welchi*, *Actinomyces bovis* and *Treponema pallidum*.

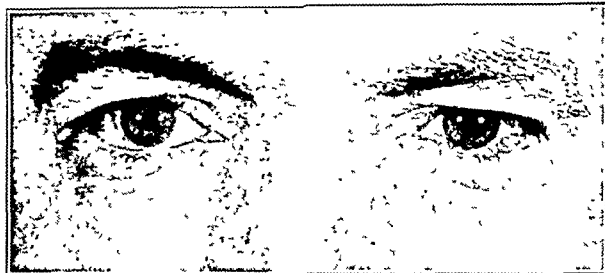


Fig. 5.—Acute allergy to local penicillin followed bilateral instillation of 4 drops of penicillin 1,000 units per cubic centimeter. Acute edema of the eyelids, congestion of the sclera, conjunctiva and the mucous membrane of the nose and throat with pyrexia and malaise were manifested.

The relief afforded by penicillin when it is effective is usually prompt, in some instances startling and usually better than that afforded by other modes of medication. Considerable penicillin can be saved by identification of the bacteria present in a disease before treatment is instituted. A primary sensitivity test is recommended in chronic infections caused by staphylococci. An unfavorable early response to penicillin therapy suggests a reappraisal of the case. A virulent resistant organism may be present.

In diseases caused by a noninfectious process such as allergy the removal of a secondary infection by penicillin is helpful but obviously leaves the primary problem unsolved.

The use of penicillin as a prophylactic in certain intraocular operations and ocular injuries is recommended. Experience suggests that it is a better practice to give an overdose of penicillin rather than an underdose. It is anticipated that the dosage of penicillin will be stabilized in the near future, but, as with all drugs, the dosage will be subject to modification in acute and resistant diseases.

Early and large doses of penicillin are indicated in orbital cellulitis secondary to infection in the paranasal sinuses and adjacent venous dural sinuses.

Penicillin solutions, because of their instability, do not lend themselves to office and home medication as readily as more stable drugs. Penicillin solution 1,000 units per cubic centimeter of isotonic solution of sodium chloride tested in vitro on a nutrient agar cup plate seeded with Oxford staphylococci produced an inhibition ring 45 mm. in diameter. After twenty-one days at room temperature the diffusion ring was still 40 mm. in diameter. Penicillin ointment is reasonably stable for at least a month at room temperature and for six months in a commercial refrigerator. There is a constant danger of contamination of penicillin by resistant organisms. Heat destroys penicillin; therefore resterilization is not feasible.

It is anticipated that in private practice penicillin will frequently have to be used in an empirical manner. In spite of this handicap it will be found that a valuable and dependable drug has been added to the armamentarium of the ophthalmologist.

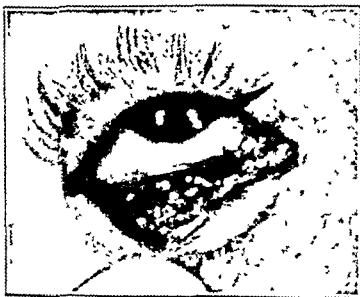


Fig. 4.—Right eye of patient with bilateral acute conjunctivitis superimposed on a chronic follicular conjunctivitis and associated with a head cold. Alpha hemolytic streptococci and coagulase negative hemolytic *Staphylococcus albus* were present in both eyes. Conjunctival cultures were sterile after five days' local treatment with penicillin 1,000 units per cubic centimeter. Treatment was continued for eight more days because of turgid palpebral conjunctiva.

THE USE OF PENICILLIN IN DISEASES OF THE EAR

CAPTAIN CLIFFORD A. SWANSON (MC), U.S.N.
AND
LIEUTENANT DANIEL C. BAKER JR. (MC), U.S.N.R.

Penicillin has been proved to be a very powerful antibacterial agent. Much has been written about its value in the treatment of many severe and previously often fatal infections. Until recently its use was restricted to overwhelming infections which did not respond to other forms of therapy. Lately the increased production of the drug has made enough available to permit its employment in more common infections, such as those of the ear.

Penicillin is a powerful antibacterial substance produced by *Penicillium notatum* in ordinary nutrient broth.¹ It is highly soluble, relatively unstable and easily destroyed by dilute acids. It is hygroscopic and rapidly loses its activity if exposed to air, but it retains its activity for twenty-four hours if absolutely dry.² Penicillin is not affected by pus, blood, serum or the products of breakdown of tissue. The number of organisms has little effect on its bacteriostatic action. Penicillin inhibits the growth of bacteria while the body defenses, humoral and cellular, destroy the organisms.³ Purified penicillin in dilution of 1:25,000,000 will completely inhibit the growth of *Staphylococcus aureus*⁴ and is free from toxic reactions.

Hobby, Meyer and Chaffee⁵ made studies of the susceptibility of various strains of many organisms to penicillin. The susceptible organisms are pneumococci, hemolytic *Streptococcus*, staphylococci, meningococci, gonococci, *Streptococcus viridans*, *Bacillus subtilis*, *Clostridium welchii*, *Clostridium septicum*, *Clostridium histolyticum*, *Bacillus sporogenes*, *Bacillus oedematis*, *Bacillus sordelli*, lactobacilli and *Cryptococcus hominis*. Insusceptible strains are *Hemophilus influenzae*, *Escherichia coli*, *Salmonella paratyphi A*, *Salmonella enteritidis*, *Bacillus pyocyaneus*, *Bacillus fluorescens*, *Bacillus prodigiosus*, Friedländer's bacillus, *Staphylococcus albus* (1 strain), *Micrococcus albus* (1 strain), *Monilia albicans*, *Monilia kruszei* and *Monilia caudata*. Gardner⁶ has observed morphologic changes in all the rod shaped organisms that showed any inhibition by penicillin. These changes are attributed to a failure of fission; growth proceeds, but division and separation of the cells do not follow in due course.

Salts of penicillin, such as ammonium, sodium and calcium, have been prepared for clinical use. The quantity of the drug used is expressed in terms of the Oxford unit. The latter is defined as that amount of penicillin which, when dissolved in 50 cc. of meat

extract broth, just inhibits completely the growth of the test strain of *Staphylococcus aureus*.⁷

According to Dawson and Hobby,⁸ the establishment of correct dosage and frequency of administration are problems of great complexity. They recommend that the sensitivity of the infecting organism be tested whenever possible in cases which do not respond satisfactorily. Penicillin can be administered by continuous subcutaneous infusion, continuous intravenous injection, intramuscular injection, intrathecal injection and local instillation. The advantages and objections to these routes have been discussed by Bloomfield, Rantz and Kirby.⁹ The more severe infections are treated by continuous intravenous injection, because a higher concentration of penicillin in the blood can be obtained. When the drug is injected intramuscularly, the blood level is lower but is more evenly sustained. If a single intravenous injection of penicillin is given, about two thirds of it will be recovered promptly in the urine.¹⁰ In his discussion in a symposium on "Antibiotic Agents," Keefer¹¹ reported that there was no universal agreement on dosage, best method of administration or duration of treatment, stating that the final answer

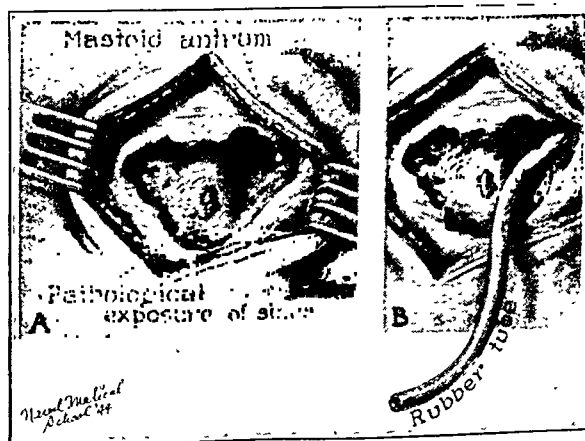


Fig. 1 (case 2).—A, mastoid cavity at completion of simple mastoidectomy; B, insertion of the rubber tube.

to these questions will come only from the study of more cases.

The Penicillin Committee at the National Naval Medical Center believes that the intramuscular administration of the drug is the most practicable. In order to ensure the therapeutic effectiveness of the drug, this committee stresses the importance of two conditions: (1) the maintenance of adequate nutrition and a positive nitrogen balance in patients receiving the drug and (2) accurate preliminary bacteriologic studies to determine that the pathogen is an organism susceptible to the drug.

Infectious diseases of the ear can be effectively treated with penicillin because the anatomic structure of the ear permits the local administration of the drug and because the organisms causing most acute infections of the ear are usually in the group considered to be susceptible to the drug. Fowler¹² made a study of 452

The illustrations are the work of Lieut. L. Schlossberg, H-(V)S, U. S. N. R.

This study was supervised by the Penicillin Committee of the National Naval Medical Center, Bethesda, Md.

Read in a symposium on "The Use of Penicillin in the Treatment of Diseases of the Eye, Ear, Nose and Throat" before the joint meeting of the Section on Ophthalmology and the Section on Laryngology, Otology and Rhinology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Fleming, A.: On the Antibacterial Action of Cultures of a Penicillium, with Special Reference to Their Use in the Isolation of *B. influenzae*, *Brit. J. Exper. Path.* **10**: 226 (June) 1929.

2. Abraham, E. P., Chain, E., and Holiday, E. R.: Purification and Some Physical and Chemical Properties of Penicillin, *Brit. J. Exper. Path.* **23**: 403 (June) 1942.

3. Florey, M. E., and Florey, H. W.: General and Local Administration of Penicillin, *Lancet* **1**: 387 (March 27) 1943.

4. Abraham, E. P., and Chain, E.: Purification of Penicillin, *Nature*, London **149**: 328 (March 21) 1942.

5. Hobby, Gladys L.; Meyer, K., and Chaffee, Eleanor: Activity of Penicillin in Vitro, *Proc. Soc. Exper. Biol. & Med.* **50**: 277 (June) 1942.

6. Gardner, A. D.: Morphological Effects of Penicillin on Bacteria, *Nature*, London **146**: 837 (Dec. 28) 1940.

7. Florey, H. W., and Jennings, M. A.: Some Biological Properties of Highly Purified Penicillin, *Brit. J. Exper. Path.* **23**: 120 (June) 1942.

8. Dawson, M. H., and Hobby, Gladys L.: The Clinical Use of Penicillin, *J. A. M. A.* **124**: 611 (March 4) 1944.

9. Bloomfield, A. L., Rantz, L. A., and Kirby, W. M. M.: The Clinical Use of Penicillin, *J. A. M. A.* **124**: 627 (March 4) 1944.

10. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, *J. Clin. Investigation* **22**: 425 (May) 1943.

11. Keefer, C. S., in abstract of discussion on the Clinical Use of Penicillin, *J. A. M. A.* **124**: 636 (March 4) 1944.

12. Fowler, E. P., Jr.: *Medicine of the Ear*, New York, Thomas Nelson & Sons, 1939, p. 157.

consecutive cases of acute otitis media. If his statistical analysis of the causative organisms in that series is considered representative of their relative incidence, then 90 per cent of the organisms are susceptible to penicillin.

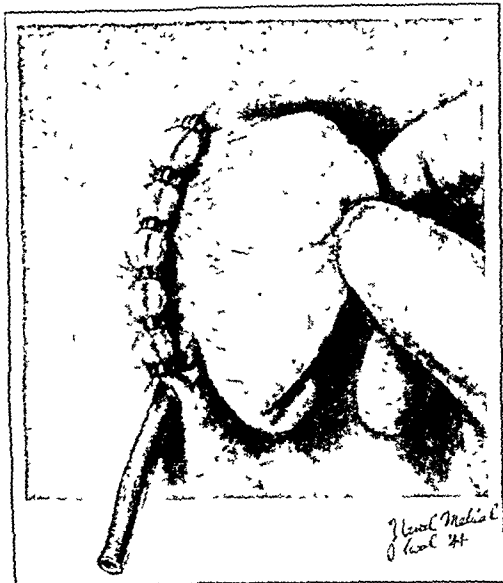


Fig. 2 (case 2)—Closure of wound for rubber tube

In this study the sodium salt was used. It was given either by continuous intravenous injection, intramuscular injection or local instillation. In 1 instance a combination of the intramuscular and local routes was used.

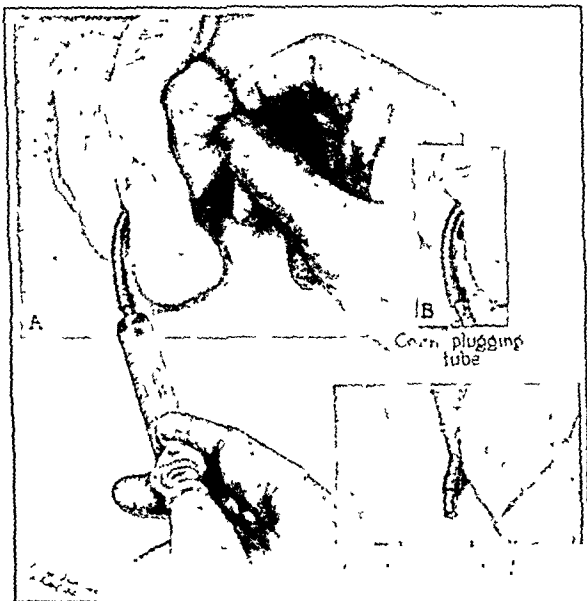


Fig. 3 (case 2)—A, wound covered with gauze impregnated with penicillin ointment and injection of penicillin solution into mastoid cavity; B, rubber tube sealed after injection of penicillin; C, tube protruding through dressing in order to facilitate aspiration of exudate and instillation of penicillin.

METHOD AND RESULTS

1. *Acute Otitis Media*.—In acute otitis media, penicillin is administered by intramuscular injection. The amount of drug necessary to combat the infection will

vary according to its causative organism and severity. Staphylococcal infections, as a rule, require a greater amount of penicillin than those due to streptococci. The drug should be continued after the patient has appeared to recover to avoid possible relapse.

CASE 1.—G. E. G., a white youth aged 18, was admitted to the hospital with the history of a sense of fullness in his left ear of one week's duration. His temperature was 100 F. Blood examination revealed red blood cells 4,700,000, white blood cells 12,450, hemoglobin content 13.5 Gm.

Examination showed severe congestion of the mucosa of both nasal chambers. The sinuses were clear. The left ear drum was red and thickened, and there was a pulsating discharge from a posterior inferior perforation. Cultures showed the organism to be a hemolytic streptococcus. He was given sulfadiazine 4 Gm. initially and then 1 Gm. every four hours. His left ear continued to discharge, and eleven days later his temperature, which had been normal, began to fluctuate between 99 and 101 F. The sulfadiazine level at this time was 11 mg. per hundred cubic centimeters of blood.

X-ray examination of the mastoids revealed the right mastoid to be well developed, well aerated and apparently clear. The left mastoid showed a less degree of development than the

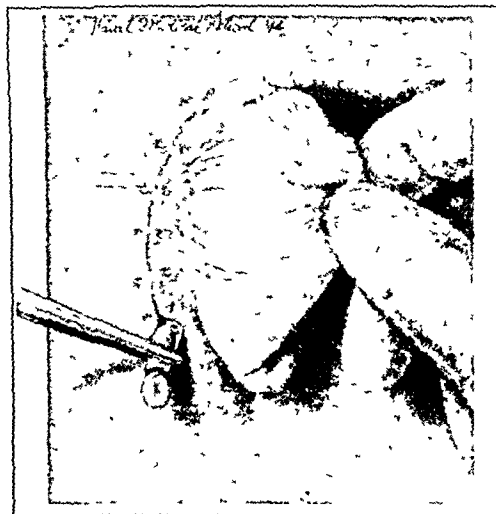


Fig. 4 (case 2)—Wound at the end of seven days, showing clear sterile exudate being expressed from the rubber tube prior to its removal.

right, and there was rather poor aeration of the cells. In the squamous portion of the left mastoid there was what seemed to be destruction of trabeculae between the air cells, and many of these cells appeared to be filled with material of soft tissue density. The impression was destructive mastoiditis, left.

Sixteen days after onset of infection, at the time when it appeared that a mastoidectomy would be necessary, penicillin was administered. Sulfadiazine was discontinued, and the patient was given 20,000 units of penicillin intramuscularly every three hours day and night for a period of two weeks.

His temperature became normal twenty-four hours after the start of penicillin and the ear became dry on the seventh day of penicillin therapy, which extended over a two week period in all. At the end of this time his left ear drum returned to normal and the patient was discharged from the hospital. He received a total of 2,260,000 units of penicillin.

It would appear that penicillin was effective in sparing this patient an operation.

Fourteen additional cases of acute otitis media were successfully treated with penicillin. The pathogens obtained on culture from these patients are listed in the table. The penicillin was given by intramuscular injection. The amount of the drug required varied from

360,000 to 1,140,000 units per patient over a period varying from five to fourteen days.

2. *Acute Mastoiditis*.—When surgical intervention is done for acute mastoiditis it can be supplemented by penicillin administered either by intramuscular injection or by local instillation into the mastoid cavity. The Floreys³ employed the latter method by means of controlled drainage in 22 cases of surgical mastoiditis. They inserted a rubber tube into the mastoid cavity and closed the incision completely except to accommodate the tube. Penicillin was then instilled into the cavity through the tube, which was then sealed off. Afterward every six hours the exudate was aspirated from the cavity and fresh penicillin was instilled through the tube, which was again sealed. Free drainage was not allowed at any time. This routine was employed for a period of five days, and an average of 17,300 units per case was required. The ear usually became dry within a period of five days, and primary healing resulted in 19 of the 22 patients. The second and third patients received the drug both intramuscularly and locally after the method of Florey with slight modification, the other only locally:

CASE 2.—S. B. H., a white woman aged 25, was admitted to the hospital with the history of having had a discharging right ear for three weeks. She had received a total of 17 Gm. of sulfadiazine and 50 Gm. of sulfanilamide before entering the hospital. In the preceding week she had complained of noc-

to lie outside the dressings. The incision was closed tightly except for the rubber tube passage. Fifteen cc. of a solution containing 1,000 units of penicillin per cubic centimeter was injected through the rubber tube into the mastoid cavity, and the external canal was packed tightly with gauze impregnated with penicillin.

Thereafter, every six hours during a period of forty-eight hours, the wound was aspirated and 3 cc. of the penicillin solution was injected into the mastoid cavity via the rubber tube (for illustration of technic see figures 1 through 4). During the same period the patient received 30,000 units of penicillin intramuscularly every three hours. On the third day the instillation of penicillin into the mastoid cavity was discontinued but the rubber tube remained completely sealed off, so that there was no drainage at any time. Also on the third day the intramuscular injections of penicillin were reduced to 15,000 units every three hours. On the seventh postoperative day the intramuscular injections were discontinued and the rubber tube was removed from the mastoid cavity. On the eighth postoperative day the incision was healed, the middle ear was dry and the perforation of the ear drum had healed. The patient had no further trouble with her ear. During the course of her disease she received a total of 1,905,000 units of penicillin intramuscularly and locally. Penicillin caused no noticeable untoward reaction and appeared to have shortened her convalescence greatly.

CASE 3.—C. J. S., a white man aged 25, was admitted to the hospital with acute appendicitis. An appendectomy was performed, and six days after operation he complained of a sore throat. On the seventh day he had severe pain and a serous discharge from his right ear. He was transferred to the eye, ear, nose and throat service the same day, with the diagnosis of acute otitis media, right ear. He was given sulfadiazine 4 Gm. initially and 1 Gm. every four hours afterward day and night. Cultures of the exudate from the right ear showed the presence of a hemolytic streptococcus. His right ear continued to discharge, and on the tenth day of the ear infection he had considerable pain over the right mastoid process and right facial paralysis. There was x-ray evidence of a right mastoiditis. The sulfadiazine level at this time was 6 mg. He was given a blood transfusion of 250 cc., and a simple mastoidectomy was immediately performed. Operation revealed pus under pressure in the mastoid cells bordering on the digastric groove, with no breaking down of the cells. At the completion of the operation a rubber tube was inserted into the wound, so that one end came in contact with the antrum and the other end protruded through the incision. The wound was closed except for the rubber tube passage. For eight days after operation once a day 3 cc. of a solution containing 250 units of penicillin per cubic centimeter was instilled into the mastoid cavity through the rubber tube and sealed in. On the ninth postoperative day the rubber tube was removed. On the tenth day the facial paralysis began to disappear, and after two weeks the patient had almost complete restoration of motion in the right side of his face. After the operation there was no purulent drainage at any time from the mastoid wound. A total of 6,750 units of penicillin was used.

In this case penicillin appeared to shorten convalescence and hasten recovery from facial paralysis.

3. *Acute Labyrinthitis*.—Penicillin can be administered by continuous intravenous injection for the treatment of acute labyrinthitis. In the following case treatment was successful by this means.

CASE 4.—L. C. P., a white man aged 33, a physician, was admitted to the hospital on Sept. 10, 1943 with the history of having had vertigo, tinnitus and deafness of his left ear for one month and severe pain in his left ear for one week. In September 1942 he had had an osteomyelitis of his twelfth dorsal vertebra caused by hemolytic *Staphylococcus aureus* and successfully treated by operation and a sulfonamide drug. In March 1943 he had had empyema of the gallbladder caused by the same organism and successfully treated by surgery and a sulfonamide drug. In May 1943 he had had what appeared

Organisms in Fifteen Cases of Acute Otitis Media

Organism	No. of Cases
<i>Staphylococcus aureus</i>	2
Hemolytic <i>Staphylococcus aureus</i>	2
Hemolytic streptococcus	8
<i>Pneumococcus type 1</i>	1
Hemolytic <i>Staphylococcus aureus</i> and hemolytic streptococcus	2

tural pain over the right mastoid and general malaise. Examination was negative except for the ear. There was a thick purulent discharge in the right canal. The ear drum showed a posterior perforation, and the mucosa of the middle ear was red and thickened. Pain was elicited on pressure over the mastoid.

X-ray examination of the mastoids disclosed that on the left side the mastoid cells were well aerated. On the right side the cells in the temporal portion of the mastoid were indistinct and the bony separations of the mastoid cells were poorly outlined and most of the cells appeared blurred. There seemed to have been definite bony destruction of the trabeculae separating some of the cells in this area.

The patient's temperature was normal on admission but fluctuated between normal and 99.2 F. for the first few days. The sedimentation rate showed a fall of 31 mm. at the end of an hour. Blood examination revealed red blood cells 3,000,000, hemoglobin content 10 Gm. and white blood cells 8,300. The urinalysis was negative.

She had lost 6 pounds (2.7 Kg.) in three weeks and felt generally below par. Soon after admission she was given 30,000 units of penicillin intramuscularly every three hours. Three days after admission she was given a transfusion of 250 cc. of whole blood. The following day a simple mastoidectomy of the right ear was performed. Operation revealed free pus, considerable breaking down of the mastoid cells in the region of the tip and over the lateral sinus, pathologic exposure of the sinus and thickening of its wall. A hemolytic streptococcus was cultured from the pus.

At the completion of the operation a small rubber tube of 14 French caliber was inserted into the wound, one end being left in contact with the antrum and the other end protruding through the incision to a length which permitted its opening

to be an attack of Ménière's syndrome on the left side without any subsequent complaints until his present illness.

On admission his temperature was 99.4 F. He had nystagmus to the right on right lateral gaze and slight nystagmus to the right on upward gaze. There was no evidence of active

4. *Chronic Otitis Media*.—In special instances chronic otitis media can be treated successfully by the local instillation of penicillin into the middle ear. The patient who has a chronic discharging ear caused by an organism susceptible to the drug and has a large perforation of the ear drum with no evidence of granulations or cholesteatoma is best suited for penicillin therapy. The pneumatic otoscope can be used to force the drug into the middle ear,¹³ and the penicillin can be sealed into the ear by means of cotton impregnated with a bland ointment (see figures 5 and 6 for illustration of technic).

CASE 5.—H. F. J., a white man aged 32, was referred to the outpatient department for treatment of a right chronic otitis media. For several years he had had continuous discharge from his right ear varying in amount. Examination showed a moderately thick tenacious discharge in the right external canal and a large anterior inferior perforation of the right ear drum; there was no granulation tissue. X-ray study showed evidence of a chronic mastoiditis on the right side. There was no evidence of a cholesteatoma. Over a period of years the patient had received different kinds of treatment, including boric acid and alcohol drops, Sulzberger powder and sulfonamide powder. Cultures showed the presence of a *Staphylococcus aureus*.

He was treated in the outpatient department. A few drops of a solution containing 250 units of penicillin per cubic centimeter were instilled into the right ear while the patient's head was inclined to the left. The penicillin was forced into the middle ear through the perforation by means of a pneumatic otoscope. The canal was then filled with the penicillin solution, and the drug was trapped in the ear by means of cotton impregnated with a bland ointment. The patient was given a small bottle of the solution to take home and was told to remove the cotton and to dry the canal after six hours. He was instructed to lie on the left side before

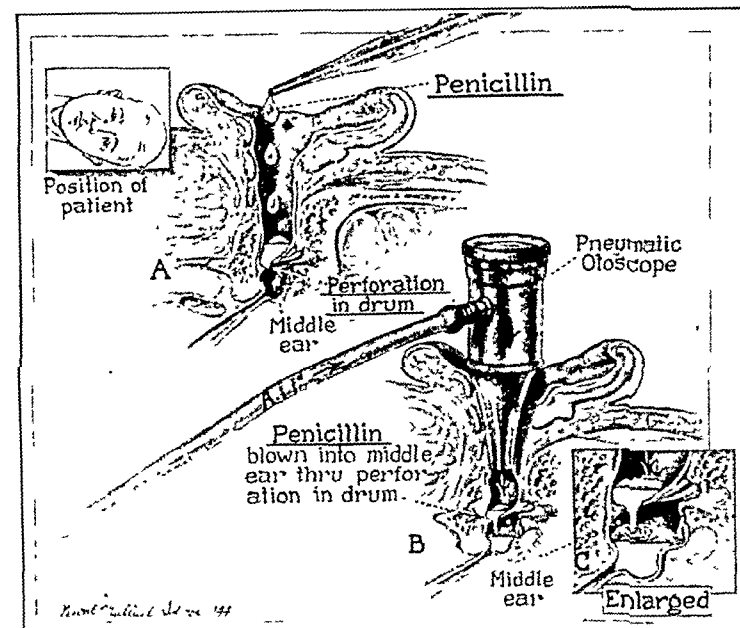


Fig. 5 (case 5).—A, instillation of penicillin into the external canal; B and C, use of pneumatic otoscope in chronic otitis media.

disease in the nose and throat. His right ear was normal; his left ear drum was injected. The left ear was totally deaf. Blood examination revealed red blood cells 4,720,000, hemoglobin content 13 Gm., white blood cells 7,750. Blood culture and urinalysis were negative. During the first twenty-four hours his temperature fluctuated between normal and 99.4 F. by mouth. He complained of severe pain deep in the left side of his head, which could be controlled only by large doses of morphine. The neurologic examination was negative except for the labyrinthine disturbances. X-rays of the skull and mastoids showed no evidence of disease.

It was the opinion of the neurologic service that the patient had an osteomyelitis of the left petrous pyramid, with involvement of the labyrinth, and that the infection was probably metastatic in origin.

The pain in his left ear became progressively worse and on his sixth hospital day a left myringotomy was performed with nitrous oxide-oxygen anesthesia. Clear fluid was obtained from the left middle ear. Cultures showed the organism to be hemolytic *Staphylococcus aureus*. In view of the history of previous severe infections with the same organism and the possibility that the middle ear disease might be secondary to cranial osteomyelitis, it was decided to give the patient penicillin. After the myringotomy, penicillin was begun by continuous intravenous injection and continued for five days. He got a total of 455,000 units. It is noteworthy that the patient was free from pain twenty-four hours after penicillin was begun and that his temperature returned to normal in forty-eight hours. His left ear was dry on the fifth day, and his ear drum gradually returned to normal. Subsequent studies confirmed the total loss of hearing in his left ear and revealed a total loss of vestibular response to left caloric stimulation.

Apparently this patient had an acute labyrinthitis on the left side, with the exudate working its way through into the middle ear. Its metastatic origin is supported by the identity of its causative organism with that of two previous infections, one of which was certainly hematogenous. He has been left with complete loss of cochlear and vestibular function on the left side. There has been no recurrence of tinnitus or vertigo.

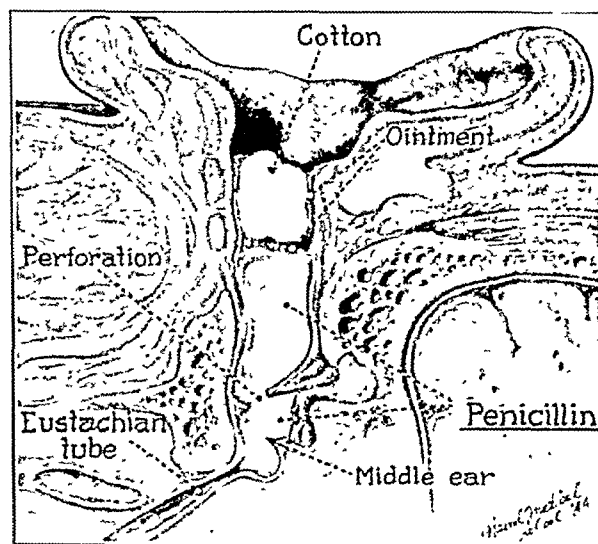


Fig. 6 (case 5).—Penicillin sealed in external canal and middle ear by cotton impregnated with ointment

going to bed and to instill a half medicine dropper of the penicillin solution into his right external canal and to trap the solution with cotton impregnated with ointment, placed at the external meatus. This routine was carried out for a period of

13. Canon, R. T.: Personal communication to the authors.

eight days. His ear became dry and has remained dry for a period of six months. A total of 10,000 units of penicillin was used. The drug had no effect on the perforation.

One other case of chronic otitis media due to *Staphylococcus aureus* was successfully treated by the same method, but several other cases did not respond satisfactorily.

SUMMARY

A study was made of the use of penicillin in diseases of the ear. The drug was found to be of value in the treatment of acute otitis media, acute mastoiditis, acute labyrinthitis and chronic otitis media. A technic was developed for the use of penicillin by local instillation into the external canal and middle ear as well as into the postoperative mastoid cavity.

Penicillin has been employed with substantial benefit in many instances in which other forms of therapy had failed. It was possible either to avoid surgical intervention for acute mastoiditis or to use the drug as a supplement to surgery with significant help.

When the drug is instilled into the mastoid cavity after operation, healing is prompt and the period of convalescence is shortened. Penicillin is the most powerful chemotherapeutic agent available to combat acute otitis media, acute mastoiditis and their complications.

USES OF PENICILLIN IN DISEASES OF THE NOSE AND THROAT

CAPTAIN F. J. PUTNEY

MEDICAL CORPS, ARMY OF THE UNITED STATES

Penicillin must not be used indiscriminately, but its effectiveness in combating susceptible infections is benefiting practically every branch of medicine. We have employed it at Bushnell General Hospital since April 1943 chiefly in overwhelming infections and complications of ear, nose and throat diseases when life was endangered. In the entire series of 19 cases the organisms were those which are sensitive to penicillin, in general the group of cocci. This presentation will be limited to the 9 cases classified as instances of sinus complications.

Originally penicillin was administered intravenously, either by repeated venous punctures every two hours or by continuous drip, but both of these methods have largely been supplanted by the intramuscular route. Continuous drip injection may be preferable for extremely ill persons with grave infections when a high prolonged blood concentration is desired. After the hazardous phase has subsided, intramuscular use may be substituted. In general, the dosage we have employed was 25,000 units intramuscularly every three hours, which was reduced to 15,000 units as the patient improved, the three hour period being maintained. Penicillin used locally is also bacteriostatic, but we have not depended on local use alone and have usually combined local with systemic administration. The organisms in all except 1 of this group of cases remained sensitive to the drug. In 1 case the organism became penicillin fast after several weeks of treatment. When there has been no improvement in the appearance of a wound and continuation of purulent drainage after three

or four days of penicillin therapy, one should suspect that the organism is resistant to the drug and sensitivity tests are indicated. In our experience failure to respond to penicillin has been due to a resistant bacterial strain.

In the early stages of using this drug while endeavoring to determine its range of usefulness, large doses were employed for many weeks without other forms of treatment. The results were disappointing in that healing was not obtained even though immediate improvement was noted. The acute conditions have afforded the most gratifying results, while in chronic diseases the response has been hard to evaluate. In the chronic cases the infections could be controlled and most of the wounds sterilized while the patients were receiving penicillin, but after treatment was terminated the infection again became active. In osteomyelitis penicillin has not supplanted surgical procedures but helps materially in combating the disease. Adequate drainage by surgical intervention in addition to penicillin was necessary to effect a cure in the majority of our cases.

Penicillin has proved equally effective against sulfonamide resistant organisms. All of our patients were given only penicillin, and none were treated by a combination of this drug and sulfonamides. Patients who had failed to respond to the sulfonamides improved under penicillin to the same degree as those that had not received sulfonamide therapy.

In this series of cases no toxic reactions to the drug either systemically or locally occurred. A few reactions such as hyperpyrexia and urticaria have occurred at our hospital, but except in a rare instance these have not constituted an indication for discontinuing treatment.

Penicillin was employed in the care of 7 cases of osteomyelitis, 5 involving the frontal bone, 1 the frontal and maxillary bones and 1 the superior maxilla. Three cases of orbital cellulitis secondary to sinusitis, 1 with osteomyelitis in addition, have also been treated.

In osteomyelitic infections granulations have been made healthy and draining purulent wounds have become sterile while the patients were receiving penicillin. It is now my feeling that the optimum time for operative measures in acute spreading osteomyelitis is during the period in which the infection has been checked by penicillin. However, it may well be that in certain acute cases if treated early and adequately the disease process may be stopped and healing will take place without radical surgical procedures. In the cases which continue to show progressive bone destruction after adequate therapy, surgical intervention may be accomplished with little risk after the wound has become dry and the cultures have become negative with healing of the surrounding cellulitis. It may require anywhere from one to two weeks of penicillin therapy to attain this state.

In chronic osteomyelitis of the frontal bone it is possible to obtain healing under penicillin therapy without resorting to extensive surgery, and a thorough trial of penicillin lasting over several months may be necessary. When there is no regression under this form of treatment it is my feeling that the involved sinus should be operated on and that this procedure in addition to penicillin therapy may prevent further extensive operations. The occurrence of exacerbations and failure of the disease to heal on discontinuing the drug may require removal of the entire frontal bone. Adequate, repeated and lengthy courses of penicillin treatment are believed to prevent this final step in some cases that might otherwise need radical intervention.

From the Ear, Nose and Throat Unit of the Surgical Service, Bushnell General Hospital, Brigham City, Utah.
Read in a symposium on "The Use of Penicillin in the Treatment of Diseases of the Eye, Ear, Nose and Throat" before the joint meeting of the Section on Ophthalmology and the Section on Laryngology, Otology and Rhinology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

One word of caution should be presented regarding the roentgen examinations, for these findings may indicate improvement and healing while treatment is being given yet at operation extensive necrosis has been found.

Brain abscess, extradural abscess and orbital cellulitis occurred as complications in 3 cases of osteomyelitis without apparent bearing on the response to the drug. The abscess of the frontal lobe of the brain was treated by the method outlined by King modified to the extent that a catheter was inserted into the cavity and local irrigations with penicillin carried out. The extradural abscess presented no particular problem, for the patient had been receiving adequate doses of penicillin and at operation the pus contained no organisms.

The longest period of treatment was that of the patient with osteomyelitis of the superior maxilla and frontal bones. He received 7,375,000 units of the drug over a period of sixty-six days. At the end of this time radical removal of the frontal bone was done because of the failure of penicillin to eradicate the infection permanently.

Our experience with other nose and throat diseases has been limited to a few cases of suppurative sinusitis treated both locally and systemically and several cases of peritonsillar and lateral pharyngeal abscesses in which the drug was given intramuscularly. The infections of the pharynx usually recovered without incision, but I do not recommend this method and I believe that healing would have followed more rapidly if drainage had been instituted. In a case of chronic purulent infection of the maxillary sinuses, cultures became sterile but the discharge continued and at operation the membrane was thickened with chronic inflammatory changes present. Acute infections of the maxillary sinuses have been cured after several irrigations with penicillin, even when the organism was a staphylococcus that had proved resistant to other forms of treatment. The strength of the solution employed locally was 250 units per cubic centimeter. Preliminary investigation of Vincent's infection of the mouth and tonsils indicates rapid healing, with disappearance of organisms after a few days of systemic penicillin therapy.

Complications of Paranasal Sinusitis Treated with Penicillin

Case	Complication	Organism	Treatment	Result
1	Osteomyelitis of maxilla	Strep. (nonhemolytic)	Incision and drainage; penicillin (general)	Recovery
2	Osteomyelitis of maxilla and frontal bone	Staph. aureus (hemolytic)	Penicillin (local and general); surgery	Recovery
3	Osteomyelitis of frontal bone; brain abscess	Staph. aureus (hemolytic)	Penicillin (local and general); surgery	Recovery
4	Osteomyelitis of frontal bone	Staph. aureus (nonhemolytic); Strep. (nonhemolytic)	Penicillin (general)	Unchanged
5	Osteomyelitis of frontal bone; orbital cellulitis	Staph. aureus (hemolytic)	Penicillin (general); surgery	Recovery
6	Osteomyelitis of frontal bone; epidural abscess	Strep. (nonhemolytic); Staph. albus (hemolytic)	Penicillin (local and general); surgery	Recovery
7	Orbital cellulitis	No culture	Penicillin (general)	Recovery
8	Osteomyelitis of frontal bone	No growth	Penicillin (local and general); surgery	Recovery
9	Orbital cellulitis	Strep. (hemolytic); Strep. (nonhemolytic); Staph. aureus	Penicillin (general); surgery	Recovery

Prompt and complete healing was obtained in 3 cases of orbital cellulitis with vanishing of pain within the first twelve hours of treatment. After the first day orbital edema, fixation and proptosis began to decrease, but the underlying disease in the sinuses remained unaffected and in 2 of the cases sinus surgery was essential. In the other case, during the early acute stage of cellulitis, before pus formation, incision and drainage were not necessary, the infection resolving under treatment. All of these patients had previously received sulfonamide therapy with little improvement.

One case of cavernous sinus thrombosis secondary to lateral sinus thrombosis and hemolytic streptococcus bacteremia was treated with the drug. Death occurred on the eleventh day of therapy, even though the initial response to penicillin was satisfactory and there was considerable improvement for a week. Daily blood cultures were positive only before penicillin was started and on the sixth day of therapy. In the first two days 400,000 units of penicillin was given by continuous intravenous drip, followed by 25,000 units intramuscularly every three hours thereafter. During the eleven days of treatment she received 2,335,000 units of the drug. At autopsy both lateral sinuses as well as both cavernous sinuses were thrombosed with an abscess of the cerebellopontine angle; so it is questionable whether surgical drainage would have altered the outcome.

I feel that at the present time penicillin in combination with adequate surgical treatment offers the most effective means of combating some of the serious and life endangering complications encountered in otolaryngology.

ABSTRACT OF DISCUSSION

ON PAPERS OF LIEUTENANT COLONEL KEYES, OF
CAPTAIN SWANSON AND LIEUTENANT BAKER
AND OF CAPTAIN PUTNEY

MAJOR ELMER A. VORISEK, M. C., A. U. S.: In the hands of my associates and myself penicillin has been used in a dilution of 500 units per cubic centimeter. In cases of gonorrheal ophthalmia it was instilled locally, four drops every hour with negative conjunctival smears and cultures after twenty-four hours, with no recurrences. Intramuscular injections were not given until after the ophthalmic infection was considered cured, except in 1 case in which the genital gonorrhea was cured with intramuscular injections, followed two days later by gonorrheal conjunctivitis in a previously enucleated eye socket. The smears and cultures were negative after twenty-four hours of hourly instillations. In our first case, in spite of rapid recovery within twenty-four hours, we continued instillations at three hour intervals for several days, and the patient developed a typical severe local allergic reaction. This reaction subsided quickly when instillations were discontinued. Even though negative smears and cultures of conjunctival scrapings may be obtained within twenty-four hours, the penicillin solution should be continued, but at less frequent intervals, until three such consecu-

tive daily examinations are reported as negative. We have also used penicillin to irrigate the lacrimal passages in cases of chronic suppurative dacryocystitis, 2 cc. of the 500 unit solution being used daily. After the second irrigation the secretion became almost negligible, and after several days only clear, amber colored, watery fluid was expressed on pressure over the sac. This led us to institute similar daily irrigations beginning within twenty-four hours after dacryocystorhinostomy, with excellent results. Several cases of orbital cellulitis with proptosis have been seen in conjunction with the otolaryngologist, but in each instance penicillin was used intramuscularly, and in 1 case the abscess also was irrigated with the penicillin. Not only did the cellulitis respond rapidly, but the purulent nasal discharge from all the sinuses promptly cleared up within forty-eight to seventy-two hours. In 1 case the low grade chronic sinusitis recurred. My associate has also been particularly enthusiastic in cases of osteomyelitis of the frontal bone secondary to suppurative, frontal sinus disease. There is every indication that, although intramuscular injections of penicillin were distinctly beneficial and were always used, the response, after periodic irrigations with penicillin, was immediate. However, it was found that even penicillin could not replace adequate surgical intervention and proper drainage. In 1 case, in which operation was performed before the advent of penicillin, the persistent drainage ceased immediately after local and intramuscular injection.

MAJOR WALTER J. AAGESEN, M. C., A. U. S.: It is our practice to give 25,000 units of penicillin intramuscularly every three hours day and night for twelve to fourteen days. Especially is this true when the offending organism is the staphylococcus. Captain Plough, in our department of bacteriology, has demonstrated that the sensitivity of different strains of staphylococcus to the action of penicillin varies considerably. He showed that the plasma level of patients receiving 25,000 units of penicillin every three hours intramuscularly does not reach a level of 1 unit per cubic centimeter, which is definitely below the concentration required to kill certain strains of *Staphylococcus aureus*. After testing twenty strains of *Staphylococcus aureus* for susceptibility to the drug, he has shown that the most sensitive strain was killed in a plasma concentration of 0.02 unit per cubic centimeter, while the more resistant organisms were not killed in a concentration of 2 units per cubic centimeter. Although at the end of three hours penicillin was readily recoverable in the urine, plasma studies have shown that after 25,000 units intramuscularly the usual plasma concentration during the first hour goes no higher than 1 unit per cubic centimeter. It drops rapidly during the second hour and is not recoverable in the third hour. There is still some doubt as to whether we are really able to shorten the convalescence of the average uncomplicated case of acute surgical mastoiditis appreciably. In chronic mastoiditis, and especially in the acute case with complications (such as meningitis, septicemia or Bezold's abscess), I feel that the convalescence is definitely shortened by the use of penicillin. It will not eliminate pus when there is inadequate drainage, and surgery is still of primary importance. We have found the drug to be effective in acute otitis media. Penicillin has produced a most gratifying response in chronic otitis. Three of our cases of long standing—from eighteen to twenty-five years—dried up completely, without healing of the perforation, in a period of from twelve to fourteen days, with a total of 2,000,000 units of intramuscular penicillin. It is still too early to state definitely that these cases will continue to remain dry. We have found that penicillin is of no value in chronic otitis media complicated by cholesteatoma or aural polyposis, except in 2 cases in which these conditions had been eradicated by surgery. Especially did we find this true when there was infection of the bone. The intravenous route, with its more even concentration, should be used until the infection has been brought under control, following which the intramuscular route can be substituted with maximum therapeutic effect. In bone infections, even though large doses were maintained in the acute cases, the results were disappointing as far as complete healing is concerned without the use of surgery.

COMMANDER E. E. KOEBBE (MC), U.S.N.R.: My associates and I have treated several hundred cases of early acute otitis media with penicillin, and the results have been universally good. We use 15,000 units every three hours around the clock for

about seven days or until the drum has resolved and the landmarks return. Then we reduce it to 10,000 and keep that up three or four days, then 5,000 for three or four days. We have treated 22 cases of meningitis complicating otitic infection. As soon as the diagnosis is established by lumbar puncture and by neurologic findings, we give 15,000 units intrathecally. We do not repeat that oftener than twenty-four hours. In most of the cases we give it intrathecally for two or three days until the patient becomes conscious or until the meningitis is under control. Supplementing the intrathecal treatment we give intramuscularly 15,000 units every three hours. We have given 20,000 or 25,000, but in most cases 15,000 units is adequate. The treatment in several instances cleared up the otitis media, so that no surgery was done on the mastoid. In most of the cases of suppurative mastoiditis the laboratory reported a sterile culture when treatment with penicillin was administered for three or four days. With penicillin, at first supplemented by the sulfonamides, recovery occurred in all otitic meningitis cases. Encephalitis cases respond well to intramuscular injections. We have treated 15 cases of lateral sinus thrombosis. In all there was a positive blood culture or occlusion of the lateral sinus demonstrated by operation or both. We give penicillin only intramuscularly at least twenty-four hours before operation, and in many cases the culture from the thrombosed sinus is sterile at operation and we have had no positive blood cultures on any one treated with penicillin for twenty-four hours. Penicillin alone is inadequate in treating lateral sinus thrombosis. An operation is necessary, but in no case have we ligated the jugular vein. We have had septic emboli occur before operation but none after operation.

CAPTAIN ROBERT HENNER, Barksdale Field, La.: I should like to call attention to the work of Schall in the use of heparin in venous thrombosis and tell of an instance of its combined use with penicillin in the case of cavernous sinus thrombosis. This patient was treated with sulfadiazine for about seventy-two hours and under this therapy became moribund and comatose and had a temperature of over 105 F. Institution of intravenous penicillin with the combined use of heparin in an intravenous solution caused the patient to develop rapidly a negative blood culture for the *Staphylococcus aureus* that was previously present, and in a period of over six weeks of recovery he was returned to full duty. We felt that penicillin offered the cure of disease only because the heparin was used in combination to provide local availability for the control of the infection.

CAPTAIN F. J. PUTNEY, M. C., A. U. S.: I should like to confirm the observation that lateral sinus thrombosis must be operated on as well as treated with penicillin. My associates and I have treated 8 cases of sinus thrombosis, and in every one the sinus was opened, but in a goodly number we were unable to remove the thrombus in the lower end of the sinus at the jugular bulb, and likewise in these cases we did not ligate the jugular vein. We gave adequate doses of penicillin, and, fortunately, did not secure any septic thrombi. Uneventful recoveries occurred.

CAPTAIN C. A. SWANSON (MC), U.S.N.: At the National Naval Medical Center, Bethesda, Md., the Penicillin Committee has now allowed us to use penicillin initially in acute otitis media in place of the sulfonamides. This should give us even better results. It was our experience in prepenicillin days that it takes mastoid wounds at least three weeks to heal. We have had only 3 cases in which penicillin was used locally in the mastoid wound and all 3 cases were healed in eight days. The Floreys in England are the investigators that first advocated the method I have described of controlled drainage. Their surgeon reported 19 out of 22 cases of primary healing in mastoid wounds.

LIEUTENANT COLONEL JOHN E. L. KEYES, M. C., A. U. S.: Those of us in the armed services have had opportunities to study penicillin that were not available to our colleagues at home; therefore it seems only proper and right that we should pass on to them at this stage, when penicillin is becoming available to them, the result of our studies so that they may now join us in further study of the usefulness and limitations of this drug.

SULFONAMIDE THERAPY OF
GONORRHEARESULTS IN 555 WOMEN MAINTAINED AT A
VENEREAL DISEASE TREATMENT CENTER

RUTH BORING THOMAS, M.D.

WILLIAM E. GRAHAM, M.D.

AND

GEORGE R. CANNEFAX

Surgeon (R), Senior Surgeon and Assistant Bacteriologist, Respectively,
United States Public Health Service

HOT SPRINGS, ARK.

Although the number of gonococcal infections in women which have been treated with sulfonamides may run into the millions, there are few reports of results in groups of patients under good enough behavior and treatment control to make them a reasonable substitute for the laboratory animal whose lack has impeded study of this infection. The present material is therefore an example of what can be achieved in a group of women, domiciled throughout in an institution where therapeutic efforts are directed toward improving their clinical condition and enabling them to pass bacteriologic tests of cure as early as possible, and where no patient is released as presumably cured until she can pass such tests. It is derived from the case records of 555 women, 200 Negro and 355 white, who were treated for culture positive gonorrhea at the U. S. Public Health Service Medical Center, Hot Springs, Ark., from December 1942 to April 1944. The mean age of this group is about 20, but a large number are still in their teens. Many types are represented, ranging from young school girls to professional prostitutes. Some are drawn from a wide area, although the greater part come from Arkansas and the adjoining states. The notably high incidence of a precarious family background is reflected in the unstable lives of these women. This background contributes its share toward their many brief marriages, lightly undertaken and soon terminated, and their uninhibited sexual behavior, whether married or single. The social unrest attendant on the war has played its part in their lives as well. Many come from small towns and villages, this being a predominantly rural state, and many have been apprehended in the vicinity of large military establishments, where they have migrated, to work sometimes as food handlers or in other poorly paid positions and consort with the soldiers for extra earnings and for pleasure. About three fourths of the total number are committed under the state quarantine regulations, which prescribe that they shall be held for treatment until noninfectious.

The admission history, which includes questions as to symptoms of gonorrhea, state of health of contacts and previous treatment, is often of very uncertain value from an epidemiologic standpoint or as an aid in establishing the diagnosis. A large proportion of the women are unaware of their infection until medical examination reveals it, and few give a history of symptoms. The most common complaints are lower abdominal pain and a vaginal discharge, though the latter complaint occurs as frequently in the nongonorrheal as in the gonorrheal patients. The incidence of clinically detectable pelvic changes is higher in these patients than the symptomatic history would lead one to expect. It has been our experience that a clinical diagnosis is of uncertain value and that the presence or absence of clinically recognizable urethritis or cervicitis, particularly in the chronic

infections, bears only a partial relation to the bacteriologic findings. Cervicitis and vaginitis from other causes are frequently encountered. This finding, in conjunction with the vague histories, often makes it impossible to date the onset of gonococcal infection or to determine its present stage. However, few of the infections in this group were considered acute.

On admission each patient received a physical examination, and a spread and culture were taken from both urethra and cervix. Cultures were taken from Bartholin's glands or rectum only in the presence of clinical changes warranting suspicion of infection. Appropriate tests for other venereal diseases, complete blood counts and urinalyses were performed. Bacteriologic tests for gonococci were repeated every other day, if negative, until a total of six had been taken, without interruption for the occurrence of a menstrual period. Indeed, through much of the study an effort was made to take at least one culture during a menstrual period, but experience has not shown this procedure to have great diagnostic value. After treatment and after six negative spreads and cultures performed over a two week period the gynecologic condition of each patient was determined by examination and, if a frank urethritis or vaginitis was still present, an attempt was made to clear this up by local therapy. Treatment was not continued, however, until all clinical signs of cervicitis had disappeared, partly because in our experience these have little relation to the bacteriologic findings but chiefly because in a rapid treatment program such a long observation period is not feasible. For the same reason, although no patients with acute or subacute pelvic inflammatory disease were released, some were discharged in whom the residual signs of such a process persisted.

After careful cleaning of the site, removing the mucous plug and massaging the cervix, cultures were made by streaking the secretions on the surface of the medium. The medium used was proteose number 3 agar and hemoglobin (Difco) fortified with glucose to make a final concentration of 0.2 per cent; 1:800,000 crystal violet and 5 mg. of para-aminobenzoic acid per hundred cubic centimeters. Glutamine¹ and liver extract growth accessory substances were added as suggested by Lankford.² Only a short time elapsed between the taking of the cultures and their incubation, which was in an atmosphere of about 10 per cent carbon dioxide at a temperature of 35 C. After forty-eight hours the cultures were inspected and were sprayed with para-aminodimethylaniline monohydrochloride, and those colonies which showed a positive oxidase reaction were stained with Gram stain and examined under the microscope. Carbohydrate fermentations were done only in exceptional cases.

In the group under consideration, treatment was never instituted except on demonstration of gonococci by culture at least once. In many instances gram negative intracellular diplococci were also found in the spreads. Every patient was treated with sulfonamides, even when there was a history of recent similar treatment. If the latter was given in the same type of institution as this center, it was considered in determining sulfonamide resistance in a few of the patients treated subsequently with penicillin. All results reported in the sulfonamide group, however, were obtained by

1. Lankford, C. E., and Snell, E. E.: Glutamine as a Growth Factor for Certain Strains of *Neisseria Gonorrhoeae*, *J. Bact.* **45**: 410 (March) 1943.

2. Lankford, C. E.; Scott, V., and Cook, W. R.: Some Aspects of Nutritional Variation of the *Gonococcus*, *J. Bact.* **45**: 321 (April) 1943.

ourselves. Each dose of medication was ingested under the supervision of a responsible member of our personnel. Most patients received sulfathiazole in either of two systems: 1 Gm. four times daily for five days or 2 Gm. four times daily for two days and then 4 Gm. daily for three days. In some instances sulfadiazine was substituted in the same dosage, but in our experi-

TABLE 1.—Results of Sulfonamide Treatment by Racial Group

Method of Treatment	White (355)				Negro (200)			
	Cure		Failure		Cure		Failure	
	No.	%	No.	%	No.	%	No.	%
1st course, 5 days.....	214	60	141	40	181	90	19	10
2d course, 5 days.....	34	27	91	73	10	53	9	47
Total cures.....	248	70			191	95		
Total failures.....			107	30			9	5

TABLE 2.—Results of Sulfonamide Treatment in Entire Group

	After 1 Course		After 1 or 2 Courses	
	No.	%	No.	%
Cure.....	395	71	439	81
Failure.....	160	29	100	19
Total treated.....	555		539*	

* Second course not given to 16 failures after one course.

ence it was no better than sulfathiazole. We adopted the larger dosage schedule to compare it with that so generally used, 20 Gm. in five days. At first it appeared to produce more cures, but later experience did not bear out this impression and it was dropped because of the higher incidence of reactions. A period of five days elapsed between completion of a drug course and the taking of the first test of cure. If the culture was still positive and the white blood cell count not unduly depressed, a second course was given of either the same or the alternate drug. If this failed, the patient was considered sulfonamide resistant. In a few instances a third course was given alone, but usually there was recourse to other measures, such as combining a sulfonamide with nonspecific protein therapy. This consisted of a series of intravenous injections of enough typhoid bacilli to produce a moderate, febrile reaction every other day for five days. About one third of the patients thus treated became culture negative. If one focus of infection was found which could be eradicated, this was attempted, but often with indifferent results, particularly in the cervix, where deep cauterizations were not undertaken. When other measures failed, artificial fever, eight to ten hours, at 106.6 F., with 6 Gm. of sulfathiazole administered during the preceding eighteen hours was used for 25 patients, with twenty-three known successes. After penicillin became available it was used in preference to other measures. In this series 10,000 units was injected intramuscularly every three hours for a total of 60,000 units. Failures were retreated with 20,000 units every three hours for a total of 120,000 units.

Part way through this study it became apparent that many of the maneuvers required to rid the white women of their gonococci were unnecessary in the Negroes. All the patients receiving artificial fever were white, as were all but 1 of those for whom penicillin was used. When case records were grouped on a racial basis the statistical differences shown in table 1 emerged.

Obviously, if such divergent results are shown to be the rule, any estimate of the effectiveness of a dosage

schedule or amount of sulfonamide treatment must take into account the proportion and distribution of the racial components in the group under consideration. Thus the total cures for the whole group of 555 sulfonamide treated women, shown in table 2, would have been higher if the proportion of Negro to white had been reversed.

The initial advantage which the "intensive" sulfathiazole treatment scheme seemed to have over the "routine" may also be explained on a racial basis, since patients were treated just as they came and no racial differentiation was made in the tabulation of the early results. As shown in table 3, when this differentiation is made there is no statistically significant difference between the final results produced by these two methods.

This study includes, as well, 50 white women whose infection proved resistant to at least two courses, or a total of 40 Gm., of sulfonamide and who were treated with 60,000 units of penicillin. The results are shown in table 4.

Since the majority of patients were asymptomatic on admission, their reaction in this respect was no measure of the effectiveness of therapy. Some noticed a decrease in the amount of vaginal discharge. In others this remained unchanged, particularly in the presence of chronic cervicitis or nonspecific vaginitis, even though the gonococcus could no longer be recovered from the secretions. It may be noted, incidentally, that when vaginitis is associated with the presence of *Trichomonas vaginalis* the removal of clinical signs of this infection through treatment does not affect favorably the course of a gonococcal infection or make it easier to cure. Local treatment of the cervix by injection of a concentrated aqueous suspension of microcrystals of sulfathiazole with a fine needle directly into the cervical tissue, in a ring parallel to the cervical canal, failed in all of 5 cases.

In some complications of the adnexa and Bartholin's glands, sulfonamides failed to produce improvement.

TABLE 3.—Comparison of "Intensive" and "Routine" Treatment Methods

Group	Total	"Intensive"				"Routine"			
		Cure		Failure		Cure		Failure	
		No.	%	No.	%	No.	%	No.	%
White.....	192	116	60	76	40	163	98	65	40
Negro.....	98	89	91	9	9	102	92	10	10
Total.....	290	205	71	85	29	265	190	71.5	25.5

TABLE 4.—Results of Penicillin Treatment of 50 White Women

Dosage	Cure		Failure	
	No.	%	No.	%
10,000 units every 3 hours for a total of 60,000	47	94	3	6

A larger number were improved clinically and symptomatically though still retaining gonococci in the cervix or urethra. Many patients with such complications were cured both clinically and bacteriologically. Chronic purulent infection of the urethra and paraurethral glands were apt to persist after gonococci could no longer be found by culture or spread. The patients themselves were practically never aware of such infections.

Reactions to sulfonamides were few and usually mild. In a number of instances sulfonamide therapy could

be completed by changing from one compound to another. Four instances of conjunctivitis occurred, usually after completion of the course. The only serious reactions were 3 instances of ureteral blocking; all occurred in patients on the intensive dosage, relatively early in the course and during very hot weather. After precautions were adopted to maintain an adequate fluid output, no more were seen. Early hematuria necessitated stopping the drug in 3 other patients.

COMMENT

In spite of the impression, so long and so generally held, that gonorrhea in women is more difficult to cure than in men, the figures here presented indicate that under controlled conditions this is not the case. Our results are strikingly parallel to those reported by Turner and Sternberg³ for the Army, both in the series as a whole and in the separate racial groups. Their figures and the recent discussion by Pelouze⁴ emphasize and support an impression apparently held by some Southern clinicians for a long time, that gonorrhea in the Negro was easier to cure than in the white person. No explanation of this difference, the reality of which now seems well established, is offered. Whether it is due to the infection of Negroes in general with strains of gonococci more susceptible to the action of sulfonamides than those found in white patients, or whether there is a higher racial immunity, cannot be decided without more evidence than we now have. If strain susceptibility is the reason, a reduction of the proportion of cures that can be obtained in Negroes with sulfonamides may be expected as the more susceptible strains die off, acquire sulfonamide resistance through exposure to sublethal concentrations of the compounds or are replaced by strains already resistant. If racial immunity is the explanation, its importance in problems of treatment and control is evident. Two important questions deserve further study, namely, whether the superiority of results with sulfonamides in Negroes will be maintained and whether the Negro race will respond relatively as much better to other treatment measures. At any rate, since much can be accomplished with the sulfonamides in women, Negro or white, they remain a useful therapeutic weapon, though not the most effective that has been or will be developed.

SUMMARY

1. Results of sulfonamide therapy, chiefly sulfathiazole, in 555 culture positive gonococcal infections in institutionalized women, are as follows: In 200 Negro women 90 per cent passed the tests of cure after one course of treatment and 95 per cent after two courses. In 355 white women 60 per cent passed tests of cure after one course of treatment and 70 per cent after two courses.

2. These results correspond closely to those recently reported with both Negro and white men in the Army.³

3. The evidence presented here indicates that under controlled conditions the bacteriologic cure of gonorrhea with sulfonamide compounds is as readily brought about in women as in men. This is true also for penicillin.

4. An explanation of the difference in response to sulfonamide therapy between Negro and white patients must await the results of further investigation.

Rapid Treatment Center.

3. Turner, T. B., and Sternberg, T. H.: Management of the Venereal Diseases in the Army. *J. A. M. A.* 124: 133 (Jan. 15) 1944.

4. Pelouze, P. S.: Progress in the Wartime Management of Gonorrhea. *Ven. Dis. Inform.* 25: 42 (Feb.) 1944.

WARTIME EXPERIENCES IN HAWAII
AFTER THE BLITZ ON
PEARL HARBOR

F. J. PINKERTON, M.D.
HONOLULU, HAWAII

In Hawaii, as in the rest of the world, the average person does not consider public health to be one's business; only when a major epidemic or disaster threatens does one become interested in, helpful to and critical of the local health board. Let the threatened calamity be brought under control, and Mr. and Mrs. Average Citizen again relax and become involved in more personal interests.

The definition of "public health" should be self explanatory in that it is health for, by and of the people and this simple fact should and must be recognized by people generally in communities throughout America—yes, throughout the world. Public health cannot be left to the public health services or to the professional worker alone, for it is the business of each one of us. It must be part of an overall community plan, as is fire protection or police protection. Laws must be enacted and violations must be punished. Public opinion must be aroused, and not only the medical men but every citizen must take an active interest. The interest of boys and girls at school, of the churches, of the employer and the employee must be aroused, and the newspaper and radio must carry the banner under the leadership of the local health agencies, both public and private. Let it be fashionable or profitable to be healthy, and a good start will have been made.

The local health official, frequently operating with an inadequate staff, finds himself limited in the extent to which he feels able to go without public interest behind him. To get this he needs the help of volunteers. He needs community backing. Such a project as this might very well engage the attention and active participation of all the chambers of commerce in communities throughout America. It is important, it is interesting, it is profitable. Healthful communities are fine communities in which to live and work. It pays dividends not only through happier lives but also by reducing loss of man hours.

Notable among the worthwhile achievements concerning public health in the Territory for the past many years has been the work of the public health committee of the chamber of commerce. I have been chairman of this committee for the past eight years and as such have at all times tried to promote the best interests of the medical profession in its relation to the health and welfare of the community. Having served in key positions with the medical societies over the past twenty-five years, as well as having managed the blood bank for the past three years, I have come to the conclusion that medical men individually, and all too frequently, collectively have shown an abysmal lack of interest and concern over the health affairs of their community. Our public health committee has more than adequate finances and has promoted such major projects as health legislation, mental hygiene, reorganization of the leprosy program, dengue fever control, poliomyelitis control, mosquito and parasite control, plague control, tuberculosis surveys, the original prewar blood bank and numerous other investigations and studies of major or minor importance to the extent that more than a million dollars has been expended by

the chamber of commerce health fund over the past several years in the interest of making Hawaii a better place in which to live.

The members of the medical profession have gradually come to accept and to appreciate the success of many of these projects, though at intervals in the past there has been keen opposition by them to some of the things which the members of the public health committee were endeavoring to do.

Our public health committee of the chamber is a unique organization in that no other organization, to my knowledge, has such funds. During the great plague epidemic in 1900, at which time a large part of the city of Honolulu was destroyed by fire, the shippers inaugurated a system of collecting a voluntary tonnage contribution of varied amounts from all persons receiving freight across the wharves in Honolulu. This procedure had the sanction of the courts and has been continued. This income, amounting to as much as \$100,000 in one year, has been available to the chamber of commerce through its health committee to expend for health improvement in the Territory, chiefly in the city and county of Honolulu, so that our community is in a position to finance immediately any project which suddenly requires attention, such as an epidemic or disaster, ordinarily taken care of by taxpayers' funds but which would ordinarily not be available without slow and unwieldy special legislation. The members of this committee have full power to act and are subject to no regulation other than public opinion.

SHORTCOMINGS OF MILITARY RULE

A powerful influence on both the public and the private health of Hawaii and its peoples has been martial law and the blackout. On the day of the blitz, Dec. 7, 1941, one of the first official acts of the governor was to declare martial law for the Territory. This was done before noon on December 7. Since that time there has been much controversy and no small amount of ill will created between the military and the civilian population regarding certain phases of the regulations. I think it is generally agreed that the civilians of the Territory were entirely favorable to the institution of martial law in the early days following the blitz. I wonder how many realize just what such a drastic regulation means to the way of life of any civilian who has not been accustomed to such regimentation. It means, in short, that everything a civilian does and says is subject to regulation by the military authorities. We in Hawaii have learned from experience that the military authorities fall far short in their understanding of proper methods to administer the purely civilian affairs of a community. While it is admitted that such drastic measures were necessary, it is also generally agreed that the methods of carrying out the necessary regulations were, many times, unnecessarily drastic and unreasonable. This naturally results when military officer executives are appointed who had had no experience with martial law on such a large scale nor any background or knowledge of the problems peculiar to that community. It is something that one is sorry to have endured, even though the experience probably has been valuable. One certainly becomes appreciative of its modifications.

All are no doubt familiar with the litigation relative to the operations of the provost court and the suspension of habeas corpus in Hawaii. Our experience with military rule convinces the large majority of us that

a commission form of government is not desirable for the people as a whole. On the contrary, our experience is the best recommendation for a continued form of democratic government. This must not be construed as a criticism of the military during the trying days after December 7. Those were critical times, and prompt and drastic action was required. There was not only the fear of attack from without but also the fear and uncertainty of attack from within, considering that we have in the Territory approximately 163,000 Japanese, 35,000 of whom are aliens and 64,000 of whom have been catalogued as enjoying dual citizenship.

One can readily understand how grave the situation might have been. Yet there has been little evidence of sabotage or organized effort to thwart the authorities in Hawaii. Immediately after war was declared on Japan the Army and Navy Intelligence, in cooperation with our own local police force and the Federal Bureau of Investigation, rounded up not only the Japanese but others as well who were known to have subversive leanings. Large numbers of these people were incarcerated as internees and subjected to a complete and thorough examination. Those found undesirable were sent either to the mainland for location in internment camps or to internment camps in the Territory. I think it is safe to say that every citizen in the Territory, regardless of racial descent, has some sort of an FBI record in the files. Some, of course, have been investigated much more critically and completely than others—and the constant fear of investigation and subjugation caused a high percentage of apprehension and mass depression.

Immediately after December 7, under orders of the military governor, every person in the Territory, from the oldest to the youngest, was compelled to have a certificate of identification issued after a comprehensive examination, including fingerprinting. Regulations made it mandatory that at all times, day or night, an identification card must be in the possession of the individual to whom it was issued. Every one—and I do mean every one—with a few exceptions was vaccinated for smallpox and given a series of typhoid injections early in 1942 by military order. Booster shots for typhoid before June 15, 1944 have now been ordered by the civil government.

INCONVENIENCES OF THE BLACKOUT

The blackout has probably been the greatest objectionable feature, because during the winter months the total blackout regulations for the Islands started at sundown, which is in the vicinity of 6 o'clock, and lasted until as late as 7:15 in the morning. This meant that all houses had to be blacked out, and when I say blacked out I mean thoroughly and completely, because there was always a guard to see that one did not have even a slight crack of light showing from the premises. If any light showed there was often no warning; one was taken to the police station and the provost judge imposed a fine from \$25 up, depending on his disposition at the moment. The second or third offense meant a stiff fine, and in many instances jail sentences were imposed. The blackout in the Territory was total and complete. This, of course, was a great hardship on people of the poorer class, because their houses were not built for such arrangements and during the hot nights people would sit in one small blacked out room sweltering from the heat and lack of ventilation.

Strangely, this did not, according to our public health records, increase our upper respiratory health conditions materially—a thing we could not understand, although we feel that it has been a contributing factor to the increase in cases of tuberculosis. It did, however, produce an increased amount of mental illness and morbidity in that direction. There were several reasons for the enforcement of such a drastic rule: the fear of attack by airplanes or ships at sea; such a regulation completely prohibited people from gathering in groups; it saved electric power urgently needed in defense projects. No one could be on the street after blackout except those engaged in essential operations, and they had to be in possession of a pass which gave them this privilege. Under no conditions were aliens ever permitted on the streets after blackout.

Gradually this regulation has been modified to the point where the curfew begins at 10 o'clock, and for the past month we have been permitted to leave our light on all night if we so desire. We are grateful for this privilege, and most of us subscribe to the argument that the blackout was probably a good thing in spite of the personal inconvenience it caused.

MENTAL HYGIENE

The physical health of any community is influenced by the mental health of its members, and this has been amply demonstrated in Hawaii since the war.

Some of our leading internists have this to say about internal upsets: "We are finding a great many more cases of general gastric and intestinal irritability, associated with much evidence of vascular instability, shown by swelling of the stomach and the intestinal or gastrointestinal membrane as shown by x-rays. This condition we have also found will be frequently associated with ulcer symptoms and frequently superficial ulceration which may go into deeper ulceration. The picture is variable. Quite sizable ulcers frequently disappear in the course of a few weeks, apparently recurring with increased mental worry or fretting over abnormal conditions. There are definitely ten times as many of these cases since the war. War and abnormal conditions have had a definite effect. Patients respond to treatment and rest."

It is suggested from our experience in Hawaii that there is more and more to the theory of an acute allergic phenomenon resulting from or associated with conditions of life which increase nerve tension. It is an interesting observation that when a patient is removed from the environment of extreme nervous tension many of his allergic symptoms disappear completely.

One large group of problems is that which includes the problems connected with the uncontrolled, promiscuous employment of women who are the mothers of many small children. At the same time we have been receiving impressive documents from Washington entitled "The Children's Charter," setting forth all the precautions to be taken to insure proper mental health for children in wartime. We see our local federal agencies employing the mothers of as many as eight children, which children are then turned loose on the community without supervision, and no children's organization had or was provided with the facilities for their care. A great deal of the damage to children resultant on this kind of occurrence is not shown in the juvenile delinquency statistics.

Another contributing factor has been the war workers brought here from the mainland. The recruiting program for these workers has been so handled as to

provide practically no consideration of the individual's history or ability to adjust to conditions here. A large number of emotionally immature persons have been brought to Hawaii, and they have not got along well. A number of psychopathic personalities, alcoholic addicts, feeble-minded persons and even psychotic individuals have been brought here by the federal agencies. The adverse conditions under which these war workers live contributed to the mental hygiene problem of this group.

Bad thinking on the part of the military and the local civilian government with regard to providing housing conditions for 75,000 people is responsible for the thousands who are living in tents, shacks and holes in the wall.

We are told that Honolulu is the most crowded city in the whole United States. It is quite as important to provide shelter for the civilian population as it is for the service personnel. Housing facilities for the civilians are woefully lacking in Honolulu.

It has been estimated by qualified observers that in Hawaii, just as it is reported to exist throughout the mainland, there is a very high percentage of inefficiency of voluntary war work among the civilian population.

PREPONDERANCE OF MEN

There is a general attitude of taking advantage of the benefits made possible by the war. I speak especially of the so-called volunteer workers. The great preponderance of the male population in our Territory is well known. Quoting from one of our best authorities, one does not have to look far to note the unhealthy effects of this on the women as well as on some of the men. This is not confined to young women: the woman over 35 has come into almost a second youth as far as masculine attention is concerned. The woman who has considered herself settled as a "wife and mother" has become socially more desirable and economically independent. When some women are suddenly given increased social status, desirability, importance and contacts always considered unavailable to her, it is not unusual to find her showing a new independence and lack of cooperativeness at home and at work. As far as the women are concerned, there seems to be a keen rivalry among the varied organizations requiring the wearing of a natty uniform. Private surveys involving thousands of men in the armed services indicate that only about 6 per cent of them demand female companionship, while 42 per cent want more sports facilities, 40 per cent want more movies and other small groups want art, photography or music. The demand by this small percentage of the overwhelming male populace for the companionship of women very easily throws otherwise stable individuals into a state of self aggrandizement and makes their contribution to the war effort secondary to their personal ambitions, which they subscribe to under the guise of patriotism and with the license that goes with it. It therefore appears that a tremendous amount of woman manpower effort is being expended for an insignificant number of men in uniform—far in excess of rational and reasonable requirements and to the detriment of many other less alluring activities.

My remarks should be modified with respect to certain volunteers, both men and women, who are doing their jobs well, and against whom no criticism should be leveled. However, if the social life that they are engaged in extracurricularly is so demanding and excessive as to render them inefficient in their full time

occupations, then the influence of the war in Hawaii has been definitely disastrous. I have a great respect and admiration for those women who are economically independent, who serve so efficiently and well in the various hospitals as nurses' aides. Many features of such work are distinctly undesirable and distasteful to women of this class, yet we find them putting in their capacity hours each day of the week and rendering an invaluable aid to the various institutions. People engaged in such activities do not need a brass band or self declaration to tell of their contribution to the war effort, because their efforts are measured and recorded by the agency to which they are assigned. We call this type of service in Hawaii measured and measurable patriotism. There are many other organizations, connected and not connected with hospitals, doing equally superior work.

Owing to the preponderance of the male population and to the fact that many men are in Hawaii without their families and are lonely and eager for companionship, with plenty of money to spend, too often the wife has found release from a humdrum existence with a suddenly uncongenial husband and left her home and family for an adventure that is happier for the moment with a mainland war worker or a member of the armed forces. She is entertained and amused and she enjoys it thoroughly. The fact that such a relationship is temporary as well as immoral doesn't seem to matter. Naturally her actions and attitude have a profound effect not only on her children but on her friends and the community. She may think that she is "getting away with it" until the great awakening.

DIFFICULTIES OF READJUSTMENT AFTER EXILE

The thousands of local citizens who were practically forced to leave the Territory during the early days of the blitz are gradually returning to Hawaii at the pleasure and will of the Army and Navy. This has been probably one of the greatest disrupting factors, but this disastrous state is gradually being corrected. Many men who sent their wives and children away soon after the blitz, with the best of motives, have found adjustments difficult to make with the long last returnings of their wives and families.

EPIDEMICS

The tremendous number of defense workers and Army and Navy personnel which has flooded Honolulu has brought to our acute attention the grave problem of venereal disease control. Fortunately our local board of health has splendid cooperation with the health departments of both the armed services. Otherwise our excellent record could not have been achieved and maintained.

For many years Hawaii has had lower than average venereal disease rates. Long before the onset of the war, board of health regulations were issued which made it obligatory to report all new cases of venereal disease—civilian, Army or Navy—to the health department within twenty-four hours after diagnosis, along with information as to the suspected sources of the disease. Since the blitz a military order has been issued along the same lines. The health department assumes the function of investigating such suspected sources.

To prevent infection among the armed services, educational activities were sharply accelerated. Hundreds of thousands of pamphlets were provided by the health department for distribution to service men. Adequate

prophylactic facilities were provided by the Army and Navy and made available to civilians.

Along with efforts to reduce the incidence of disease in the many thousands of soldiers and sailors stationed in and advancing through Hawaii, case finding and educational activities for the civilian community have also been augmented.

Since the summer of 1942 there has been a decided increase in public interest concerning venereal diseases. Newspapers have devoted considerable news space and some editorials on the subject, and all radio stations in the Territory have provided free time for the release of venereal disease broadcasts. This change of public attitude was reflected in the passing of the Prenatal Blood Test Law by the 1943 session of the legislature.

In cooperation with the Department of Public Instruction, classroom teaching about the venereal diseases has been instituted in the high schools. As far as possible this instruction is integrated with that concerning other communicable diseases. There has been a compulsory chest x-ray examination of all food handlers. A Wassermann test has been done at the same time in an effort to promote the control of venereal diseases.

Incidence of tuberculosis deaths in 1940 was 63 per hundred thousand, based on a population of 426,654. In 1943 this had dropped to 56 per hundred thousand, based on an estimated population of slightly more than one-half million. This indicates that the effect of the war on the incidence of tuberculosis deaths has not been adverse.

However, there is a definite increase in the number of tuberculosis patients in the Territory. It is estimated that in 1940 there were 1,474, whereas in 1943 this had increased to 1,949. The patients hospitalized in sanatoriums throughout the Territory were 860 in 1940 as against 1,063 in 1943.

Contributing factors of the increase are, of course, increased population and the large numbers of defense workers, the majority of whom had totally inadequate physical examinations. The majority of these people are located in and around Honolulu. There was also a large migration from the outside islands to Honolulu for war work. Overcrowding is probably the greatest single factor in this increased incidence of tuberculosis. The stress of modern living, prolonged physical and emotional fatigue, overcrowding, poor ventilation resulting from blackout restrictions, bad eating habits, lack of recreational facilities and overindulgence in alcohol greatly contributed to the increased number of cases of tuberculosis. Though an improved system of case finding has been adopted by the board of health, it is generally considered that this has not been the sole reason why so many new cases have been discovered.

Forty-three thousand 4 by 5 inch films have been taken since 1942, the majority of these being of the draftees and the food handlers, who by law are compelled to submit to a chest x-ray examination. In Hawaii 2 per cent of our draftees presented x-ray evidence of tuberculosis, as did 3.5 per cent of the food handlers. It is estimated that there is a bed shortage for cases of tuberculosis in the Territory of approximately 1,000. Honolulu at the present time seriously needs from 400 to 500 additional tuberculosis beds. But if we had these additional beds we would not be able to supply personnel sufficient to care for the patients, as all of our formerly available help are now engaged in war work at fantastic salaries, and more glamor and excitement are attached to these war positions.

The following observation is interesting and has a direct bearing on the increased demand for medical care: An analysis of the statistics from our community clinic indicates that since 1939 the number of charity patients visiting this clinic has diminished more than 60 per cent, though the cost of each individual visit is exactly double in 1943 what it was in 1939. In 1939 it cost us 78 cents per visit for 72,169 visits, while in 1943 it cost us \$1.57 each for 34,591 visits.

A dengue fever epidemic began in the Waikiki district in the early part of 1943. The total number of cases, exclusive of the military cases, was 1,485 as of May 3, 1944. Assisted by specially trained corpsmen of the U. S. Army, two hundred persons are constantly at work in the control of dengue.

An epidemic of poliomyelitis started early in 1943, and an emergency hospital was set up originally by the Office of Civilian Defense in April 1943 on the ground of the Shriners Hospital, when there were 58 patients. On Sept. 1, 1943 the Emergency Poliomyelitis Hospital was formally taken over by the Aloha Temple of the Shrine and conducted as a separate institution from funds of more than \$200,000 donated by the public for the emergency. To date 100 patients have been admitted, the average daily cost per patient being \$17.25. The epidemic soon abated and at the present time there are but 4 active cases.

THE BLOOD BANK

So much has been said about the part played by the Civilian Blood and Plasma Bank at the time of the blitz that further information may be desired concerning the operation of the blood bank since that time. This bank was in operation for almost a year before the blitz.

One of our aims, when we could gather our forces together after the blitz, was to determine the blood type of every resident in Hawaii. We have fallen far short of that aim but are pleased to report that approximately 250,000 blood typings have been done. Our statistics clearly demonstrate that race influences the blood type of an individual, although we cannot determine race by blood. International averages show 43 per cent O, 40 per cent A, 12 per cent B and 5 per cent AB. Our percentages follow quite consistently, 36 per cent O, 39 per cent A, 18 per cent B and 7 per cent AB.

Owing to the blackout conditions and the military order forbidding citizens to be on the streets during the blackout hours, Honolulu was faced with the difficulty of providing emergency blood transfusions. So immediately after the blitz the blood bank, operating then under the direction and control of the Office of Civilian Defense, instituted a whole blood and plasma transfusion service readily available to all the hospitals in and near the city. At our main blood bank on the Queen's Hospital grounds, donors were received, and after all the necessary laboratory work was done on the bloods they were then distributed to the various hospitals to be kept under refrigeration pending their need. This was a godsend to the people of Hawaii. Out of that emergency need we developed a lend-lease plan whereby blood from our central stores could be used at any time on any and all patients and in such quantities as were required, the only condition being that this blood be replaced by a friend or member of the patient's family, who was required to give his blood at the central bank. To date, approximately 30,000 donors have been received at the Honolulu Blood and

Plasma Bank. The excess of blood that is not used for whole blood transfusion is returned to the central bank within seventy-two hours and processed into plasma.

On Oct. 1, 1943 the operation of the blood bank under the Office of Civilian Defense was turned over to a board of directors of an organization chartered by the Territory, and it has been maintained since that time on an independent self-supporting basis. We have enjoyed excellent cooperation from the Army and Navy medical departments. Approximately one half of our donors come from the people in the armed services, who, of all people, have come to appreciate the importance of plasma and blood transfusions. No charge is made to the armed services for the use of blood or plasma. We give to the various hospital units and the ships at sea as much blood and plasma as they ask for, without charge and without red tape. Our budget per month runs in the vicinity of \$5,000. This money is raised from service charges of \$5 per dose of blood and \$10 per dose of plasma, when the amount borrowed is replaced; and from direct charges to patients who are unwilling or unable to send in donors to replace the blood or plasma used, at the rate of \$20 per dose for blood and \$25 per dose for plasma. In these lucrative times, when every one has money, we have been faced with the situation on several occasions when we had more money than blood. People often prefer to pay us as much as \$300 for blood that has been used in an especially severe case than to send in, say, fifteen donors to replace it. On several occasions we have been compelled to use prison donors; whom we pay \$10 for each donation. This is done only when our supply of donors runs short because of cash payments. In order to have a cash reserve for emergency needs, as director of the blood bank I made a personal appeal to a few prominent business corporation heads, and within three days \$20,000 was donated, which we are using as a revolving fund on a reserve basis.

An interesting observation has been made with regard to the percentage of serologic tests done on all donors since the beginning of our bank. In the first year of operation more than 5 per cent of our donors showed a positive Kahn or Wassermann reaction. When such a report is found, in cooperation with the board of health, measures are immediately taken to put the patient under treatment, and, of course, he does not return to the blood bank again because we have advised him that his blood is unsuitable, but we have accomplished a great public health benefit as a case finding agency among a large number of people, who perhaps were ignorant of the fact that they had a syphilitic infection. With each succeeding year, since our early days, there has been a noticeable drop in the percentage of positive Wassermann and Kahn reactions. Since December 1942 we have used the Kline exclusion test on all donors, and only those bloods which are Kline negative are used for whole bloods. Doubtful and positive Klines are checked by the Kahn standard test, and those bloods which are negative Kahn are used for plasma.

We have built up a reserve of plasma to be used at a time of disaster, such as another blitz, and the Peacetime Blood and Plasma Bank, which has existed since Oct. 1, 1943, has accumulated a considerable reserve of plasma for local and emergency needs.

The blood bank has been responsible for making anti-Rh serum available to all service and civilian hos-

pitals.. The blood bank has itself done Rh testing on some 1,500 donors and has developed a register of Rh negative donors of all four blood types. In this connection it is interesting to note that the percentage of Rh negative persons among Caucasians is the same as that found by the Certified Blood Donors Service, i. e. 15 per cent, but so far we have found only one Oriental who is Rh negative, and not any Filipino or Hawaiian-Oriental who is Rh negative.

The blood bank has sponsored the use of specific substances A and B, developed by Witebsky and his associates. Ten cc. of these substances is added to type O blood so that it can be given in emergencies when the patient's type is unknown, without cross matching. We have also found that "treated O," as we call this blood when the substances are added, can be used for specific type patients without reaction and, in fact, to advantage when it is difficult to secure a compatible blood in subgroup patients. We are now using more than 50 "treated O" bloods per month, out of a total of approximately 400 bloods per month.

PROCUREMENT AND ASSIGNMENT

Since my appointment as chairman of the board of Procurement and Assignment Service for Physicians for the Territory of Hawaii we have met once each week for the purpose of determining the availability of physicians for military service or their essentiality to the community. One major conclusion should be mentioned. The board of the Procurement and Assignment Service feels unanimously that its responsibility in keeping a man out of the service if he desires to go in is even graver than it is in making him available for military service and forcing him into the Army or Navy when he does not want to go.

The geographic location, the varied races involved and the new people that are constantly coming to Hawaii on defense projects have made our problem in Hawaii particularly and peculiarly difficult. The facts that a large percentage of our population is of Japanese ancestry and that 30 per cent of the physicians of the Territory are of Japanese ancestry have made our problem in this regard unique. Since Japan is our enemy, it is understandable that the Army and Navy are rather loath to accept commissioned officers of Japanese ancestry, even though they may be American born and have good records. On the other hand, the board of the Procurement and Assignment Service is confronted with this great dilemma: If the Japanese physicians are not acceptable to either of the armed services, and if our percentage quota of doctors per thousand of population is such that we can spare medical men for the services, then the ratio of doctors per thousand for the various racial groups will be thrown entirely out of balance if only our Caucasian doctors are accepted in the armed forces. Such a situation then resolves itself to this conclusion: that because they are Japanese they are literally enjoying protection and immunity and are being given a favored place in the scheme of things, since they are allowed to remain behind to build up lucrative practices which should belong to Caucasian citizens rather than to alien Japanese physicians or American born Japanese not acceptable for military duty.

The operation of the Selective Service laws as now being conducted in the Territory make no racial distinctions. Japanese are inducted alike with all the other races. The board of the Procurement and Assignment Service finds it very hard to reconcile the attitude

of the Surgeon Generals in refusal to accept Japanese commissioned officers when they do accept in the Army Japanese draftees and volunteers. The board of the Procurement and Assignment Service therefore has come to the conclusion that it cannot, in fairness to the citizens of Hawaii who also need good medical care, certify as available only a large number of Caucasians, to the detriment of the white population and to the distinct advantage of the Japanese race. It is to be noted here, in fairness to the American born Oriental physician, that a large number of these boys are very desirous of entering the military service if for no other reason than to show the American public that they are good American citizens.

To date 36 physicians from Hawaii have already entered the armed service, and 37 additional physicians have been certified as available. Of this number 19 are Caucasian, 3 Chinese and 15 Japanese.

All Hawaii has been rated as number 1 for critical wartime classification purposes. From my remarks you can understand just how disastrous has been and continues to be the effect of the war on Hawaii. As an outpost for national defense, as a supply port for all Pacific operations and as a rest and recreational zone for the millions of service men, you can readily understand the tremendous changes that must have taken place in our formerly peaceful islands.

1013 Bishop Street.

Clinical Notes, Suggestions and New Instruments

REACTIONS FOLLOWING MASS ADMINISTRATION OF SULFADIAZINE

COLONEL RUSSELL V. LEE
MEDICAL CORPS, ARMY OF THE UNITED STATES

Because of the large number of persons involved and the importance of learning the frequency of reactions following the administration of sulfadiazine, this report seems justified. As a prophylactic against pneumococcal, streptococcal and meningococcal infections 25,000 men and women were each given a single dose of 2 Gm. of sulfadiazine during a five day period in December 1943. Thus an unusual opportunity was furnished for observing sulfonamide reactions.

The drug was given under the supervision of a medical officer as a single dose of 2 Gm., in most cases immediately after breakfast. Those receiving it were instructed to drink two glasses of water and to refrain from exercise and alcohol for twenty-four hours. The men were instructed to report any untoward effects and, if known to be sensitive, were advised to refrain from taking the drug until such cases could be individually investigated. As is inevitable, however, in such a large number of persons, a few who knew they had had reactions previously did take the drug, and these persons developed the most serious group of reactions.

A total of 128 reactions (0.51 per cent) came to the observation of the medical officers. Of these, 9 (0.036 per cent) were serious enough to require hospitalization. Four more were listed as serious but hospitalization was not done, making a total of 13 (0.052 per cent) in this group. An additional 115 (0.41 per cent) of "mild reactions" were seen in the dispensaries. These can well be described by groups as (a) mild, cutaneous, (b) mild, general, (c) severe, cutaneous, (d) severe, general, and (e) serious, general.

(a) *Mild, Cutaneous* (15 patients).—These were persons who exhibited a mild, generalized erythematous or follicular rash of short duration. It is likely that there were a good many more of these that did not come under observation. An interesting

The author is Chief of Professional Services, AAF Regional Hospital, Santa Ana Army Air Base, Santa Ana, Calif.

feature was that almost all of these showed a greater or less degree of conjunctival injection, which was a definite feature of the more severe cases. The only treatment advised was to take a large amount of water.

(b) *Mild, General* (100 patients).—These persons complained of a variety of symptoms, in the order of frequency malaise, nausea, diarrhea, vomiting and faintness, which were attributed, either by the patient or by the medical officer, to the drug. It is not unlikely that other causes may have been operative in some of these men, and, in view of the fact that they were warned to be on the lookout for untoward symptoms, the psychic factor cannot be disregarded. Rest and a high fluid intake were the only therapeutic measures, and all this group were well within twenty-four hours.

(c) *Severe, Cutaneous* (4 patients).—Two of these patients developed an exfoliative dermatitis which required treatment over a period of days. Both of them had had previous reactions to the drug, 1 of them having developed an exfoliative dermatitis on a previous occasion when he had a local application of a sulfonamide in an ointment. Two others developed edema, somewhat suggestive of angioneurotic edema, which, however, yielded readily to injections of epinephrine.

(d) *Severe, General* (6 patients).—It seems best to list these separately, with a brief summary of each case:

CASE 1.—The man received 2 Gm. of sulfadiazine at 3 p. m. Chills sensations occurred at 7 o'clock. He was admitted to the hospital at 9 p. m. with a temperature of 99.6 F., weakness, malaise, mental haziness and depression. No abnormal physical manifestations were observed except conjunctivitis. Treatment consisted of forced fluids. The temperature the next afternoon was 99.6 F. The patient was normal and asymptomatic on the third day. The most evident symptom was mental confusion.

CASE 2.—Two grams of sulfadiazine was administered at 2:30 p. m. Chills occurred at 7 p. m. The patient was hospitalized at 8 o'clock with a temperature of 99.6 F., clouded sensorium and conjunctival injection, but no rash. He had taken the drug in September 1943 and his temperature rose to 104 F. afterward. He was afebrile and asymptomatic at twenty-four hours. Treatment consisted of forced fluids.

CASE 3.—A woman was given 2 Gm. of sulfadiazine at 10 a. m. She had pain in the eyes and lacrimation at 1 o'clock with chills and fever to 101 F. At 7:45 a generalized rash appeared, swelling of the eyelids and upper lip and a temperature of 102.4 F. (maximum). The fever lasted thirty-six hours. At 4:30 p. m. there was generalized edema. By next day all swelling except that of the hands had disappeared. Forty-eight hours later the patient was practically normal again. She had taken a sulfonamide compound in July 1943 for otitis and had a rash at that time which lasted for three days and looked like measles but with no conjunctivitis at that time.

CASE 4.—The patient was given 2 Gm. of sulfadiazine at 10 a. m. He was admitted at 3 o'clock with headache, vomiting, loose stools, chills, fever, photophobia, a temperature of 103 F. by evening, which was normal next morning, the skin showing a general blush and the conjunctivas much injected. In June 1943 he had been given sulfadiazine and developed "measles" two days after stopping the drug. It is not certain whether this really was measles or a reaction.

CASE 5.—Two grams of sulfadiazine was given at 9:30 a. m. By afternoon burning and itching of the entire body occurred. At 4 p. m. the eyes were swollen. Physical examination showed considerable edema of the face, lip and orbital regions, with edema extending down in the neck. The concentration of sulfadiazine was 4.1 mg. per hundred cubic centimeters of blood. Epinephrine was given, and the edema promptly subsided.

CASE 6.—Two grams of sulfadiazine was given at 9:30 a. m. By noon intense general redness of the skin and pronounced edema of the feet and legs half way to the knee had developed, with exfoliative dermatitis the next day. The patient had moderate general malaise, with a temperature of 99.6 F., anorexia and slight nausea. The dermatitis still persisted after two weeks. General symptoms subsided in thirty-six hours.

(c) *Serious, General* (3 patients).—CASE 1.—A man aged 31 was given 2 Gm. of sulfadiazine at 4:30 p. m. Headache,

dizziness and pains in the joints and legs had developed by 6:20 and fever at 7 o'clock, with chills and generalized pains, which were very severe; the legs were stiff. He was at his home. He went to bed at 11:30. His temperature was 102 F. He went to sleep. At 1:30 a. m. he vomited; his temperature was 104 F. He called the medical officer next morning and was admitted to the hospital semicomatose, going on to coma, the temperature 104 F., rising to 105.8. Physical examination showed general flushing of the skin, generalized edema, pronounced swelling of the finger tips and conjunctivitis. There was no pulmonary edema. The patient was comatose about six hours and then decidedly irrational. Breathing was difficult, with audible rhonchi. A generalized maculopapular rash developed. Intravenous dextrose was given, epinephrine and atropine, with continuous oxygen inhalations. The patient came out of coma in about twenty-four hours. The temperature, which reached the highest point, 105.8 F. rectally, twenty-four hours after the drug was taken, dropped to 103 the next day, 99.6 the third day, and was normal on the fourth day. The patient was critically ill for thirty-six hours but went on to complete recovery. He had taken sulfadiazine before, in June 1943, when he developed a temperature of 104 F. and a generalized rash, both of which cleared up promptly after the drug was stopped.

CASE 2.—Two grams of sulfadiazine was given at 6 p. m. Next morning chills and fever had developed, with general malaise and headache. The patient collapsed and entered the hospital at 7 p. m. Physical examination showed slight edema of the skin of the face and lips, flushed face and red pharynx. The temperature was 104 F. on entry, rose to 105.6 by evening and was normal the next day. The patient was treated with intravenous dextrose and epinephrine and went on to uneventful recovery in three days. Moderate stupor was present during the febrile period. There was no history of previous sulfonamide administration.

CASE 3.—Two grams of sulfadiazine was given at 9 a. m. At 9:30 the patient became dizzy, and his throat was parched. At 10:30 he could not walk because of vertigo and became unconscious. He was admitted to the hospital at 1 p. m. with pain in the chest, dyspnea and delirium. Owing to misapprehension of his condition he was given two additional doses of sulfadiazine, 2 Gm. and 1.5 Gm. four hours later, and his condition became worse, with coma and severe dyspnea. Sulfadiazine was stopped. He was given intravenous dextrose, and his condition improved rapidly. His temperature fell to normal on the third day, and on the fourth day he was entirely normal. He showed a scarlet flush of the skin, edema of the eyelids and upper lip, and mild conjunctivitis. The concentration of sulfadiazine was 10.7 mg. per hundred cubic centimeters of blood and 5.7 mg. per hundred cubic centimeters of spinal fluid. He had two previous reactions to sulfadiazine in April 1943 and July 1943, on each occasion having fever, vomiting and stupor.

COMMENT ON SERIOUSLY ILL PATIENTS

The remarkable feature of these 3 cases was the high fever and the mental state, which ranged from coma through delirium to mild confusion. Patient 1 of this group was critically ill and might easily have died had not proper therapeutic measures been instituted. It is noteworthy that most of the seriously ill patients gave a history of previous administrations of sulfonamide drugs and previous reactions. As soon as close medical supervision was given to the administration of sulfadiazine, and persons who were known to be sensitive were thereby discovered and prevented from taking the drug, there were practically no more of the serious febrile reactions.

SUMMARY AND CONCLUSIONS

After 2 Gm. of sulfadiazine was administered to 25,000 persons, 0.50 per cent showed reactions, 0.036 per cent showed serious reactions and 3 patients were critically ill.

Treatment with intravenous dextrose and epinephrine was efficacious in the severe reactions.

No cases of urinary suppression or of agranulocytosis were observed.

A careful history of possible previous sensitization should be obtained before sulfonamides are administered.

Council on Pharmacy and Chemistry

PATHOGENIC BACTERIA, RICKETTSIAS AND VIRUSES AS SHOWN BY THE ELECTRON MICROSCOPE

THEIR RELATIONSHIPS TO IMMUNITY AND
CHEMOTHERAPY

II. RELATIONSHIPS TO IMMUNITY

STUART MUDD, M.D.

PHILADELPHIA

THE MICROBIOLOGIC SCALE OF PARASITISM

The bacteria, rickettsias, pleuropneumonia-like organisms and viruses are the smallest and simplest known forms of life. These microscopic and ultramicroscopic forms may be arranged in a scale of diminishing size and complexity of organization. This scale in general parallels a scale of diminishing metabolic independence and of increasingly obligatory parasitism. No implication is intended that such an arrangement rests on genetic relationship. No preference is implied either between the hypothesis that the viruses represent primitive forms from which more complex forms of life have evolved⁷⁶ and the alternative hypothesis that the viruses are degenerate forms which have lost in their parasitic habit the means for their own independent existence.⁷⁷ Either hypothesis can be supported, but without decisive evidence. Arrangement of these minute forms in a microbiologic scale, even if somewhat artificial, however, does afford a certain rational continuity in the consideration of their structure and organization and of their relations to immunity and chemotherapy.

Bacteria are of course the largest of these micro-parasites. Bacteria have a definite cellular morphology. In metabolism bacteria range from autotrophic forms to highly parasitic forms. The autotrophic forms are capable of growth on an inorganic substrate and using either sunlight or oxidation of such material as sulfur or ammonia as a source of energy; they must therefore be fully endowed with the enzymes and metabolic systems essential for the synthesis of all the components of their protoplasm.⁷⁸ This protoplasm is as complex, however, as that of other bacteria and of higher forms of life.

The parasitic forms are deficient in one or many of the synthetic mechanisms essential to their growth and therefore dependent on their hosts to supply certain growth factors. The growth factors already known to be required by one or more parasitic bacteria include most of the amino acids, purines, pyrimidines, fatty substances (e. g. oleic acid), vitamins and more

complex substances (e. g. hemin and coenzyme for *Hemophilus influenzae*⁷⁹ and phthiocol for *Johnie's bacillus*).⁷⁸

In pathogenicity bacteria range from free living forms which cause disease only through accidental ingestion of their toxic metabolic products, as in the case of *Clostridium botulinum*, through "opportunistic invaders" such as streptococci and staphylococci, to obligate parasites such as *Treponema pallidum* and *Mycobacterium leprae*, which have rarely if ever been cultivated in their virulent state outside the body. Defense against bacteria is feasible through specific active and passive antitoxic and antibacterial immune mechanisms and by means of currently available chemotherapeutic and antibiotic agents.

Rickettsias are smaller than bacteria but have essentially similar cellular morphology.⁸⁰ The pathogenic rickettsias have either lost or never achieved their metabolic independence, can be cultivated only in the presence of cells and are intracellular in their parasitic habit.⁴⁴ Specific preventive measures are in practice against rickettsial diseases but specific measures for treatment are not as yet known.^{80a} Successful chemotherapy of louse borne typhus fever by para-aminobenzoic acid is also currently described.^{80b}

The known viruses range in size from those of the psittacosis-lymphogranuloma group and the pox diseases, through influenza virus and the bacteriophages, down to the plant viruses, which are "macromolecules." A typical large virus, vaccinia, has been shown to have an essentially cellular morphology, with cell wall and differentiated inner protoplasm.⁵¹ The bacteriophage particles, which are smaller than vaccinia, still have a complex morphology; they must be at or near the limit of cellular organization. The plant viruses, as far as now known, are giant molecules; the best studied of the macromolecular viruses appear to be composed solely of nucleoprotein.

The viruses are metabolically dependent on the cells within which they are obligate intracellular parasites. Specific active and passive prophylactic measures are in general very effective against virus diseases, but in general both specific immune and current chemotherapeutic measures are of very limited therapeutic value in viral diseases. Specifications for effective chemotherapeutic agents against viruses can be drawn up, however, and there are reasons for hoping that such agents may eventually be realized in practice, as will be discussed later.

THE MORPHOLOGY OF THE MICROPARASITES IN RELATION TO IMMUNITY

Bacteria and rickettsias as examined by ordinary bacteriologic methods appear to be simple and structureless. Special methods, of course, may serve to demonstrate flagella, capsules and even cell walls.¹⁴ But the long habit of observing such minute and apparently simple objects is often reflected in methods of dealing with bacteria in practice as though they were much

Dr. Mudd was chairman of the Committee on Applications of the Electron Microscope, National Research Council, 1940-1944.

The privilege of republishing certain of the electron micrographs was extended by the authors and the journals cited in the corresponding references in the bibliography and by the Williams and Wilkins Company, Baltimore.

The first instalment of this paper, on Morphology, by Stuart Mudd, M.D., and Thomas F. Anderson, Ph.D., appeared in *THE JOURNAL* October 28, p. 561. Illustrations referred to in the present paper which did not appear in the preceding instalment will appear in the reprints.

76. Boycott, A. E.: *The Transition from Live to Dead: The Nature of Filtrable Viruses*, Nature, London, Supplement 123: 91-98 (Jan.) 1929.

77. Laidlaw, P. P.: *Virus Diseases and Viruses: The Rede Lecture*, 1938, Cambridge University Press.

78. Mueller, J. H.: *Nutrition of the Single Cell: Its Applications in Medical Bacteriology*, Harvey Lecture, to be published in the Harvey Lectures for 1943-1944, Series 39, Science Press, 1944.

79. Lwoff, A., and Lwoff, M.: *Studies in Coenzyme B*, Proc. Roy. Soc. London, series B 122: 352-373 (May) 1937.

80. Pinkerton, C. Plotz, Smadel, Anderson and Chambers.

80a. Successful treatment of murine typhus under rigorous experimental conditions has recently been described, however (Moragues, V.; Pinkerton, H., and Greiff, D.: *Therapeutic Effectiveness of Penicillin in Experimental Murine Typhus Infection in dba Mice*, J. Exper. Med. 79: 431-437 [April] 1944). The authors write "The results would seem to justify a thorough clinical trial of penicillin in human typhus."

80b. Yeomans, Andrews, and others: *The Therapeutic Effect of Para-Aminobenzoic Acid in Louse Borne Typhus Fever*, J. A. M. A. 126: 349 (Oct. 7) 1944.

simpler than they actually are. The vivid demonstration by the electron microscope of structural differentiation within the cells of bacteria, rickettsias and even the larger viruses should lead to the further development of discriminating methods of using micro-organisms as diagnostic agents and as the means for producing active and passive immunity.

Immunity Against Bacteria.—Diagnostic Reactions: Theobald Smith and Reagh⁸¹ in 1903 demonstrated the structural and immunologic distinctness of the antigens, respectively, of the flagella and of the cell wall of *Salmonella cholerae-suis*. Analyses of the reactivities of the several flagellar and somatic antigens of more than a hundred intestinal pathogens of the typhoid-paratyphoid-food poisoning group are now available and are systematized in the Kauffmann-White or International schema,⁸² which is the current standard for classification and etiologic diagnosis within that group. Electron micrographs of the cells and flagella of typhoid bacilli and their modification by specific immune serums are shown in figures 47 and 48.

Avery and Heidelberger⁸³ demonstrated the structural and immunologic distinctness of the antigens respectively of the capsules and of the cells of pneumococci. The specific capsular polysaccharides proved to be the practically important antigens of the pneumococci. The diagnostic capsular swelling phenomenon,⁸⁴ the Francis skin test and the choice of type specific therapeutic serums are all based on the specific reactivities of the respective capsular polysaccharides. Electron pictures of the capsular swelling reaction are shown in figures 23 and 24.

A more recent example of a localized bacterial component used as a diagnostic reagent, in the preparation of which insight gained with the electron microscope was used, is the agglutinin of virulent *Hemophilus pertussis*, which is currently proving useful as a reagent for estimating susceptibility to whooping cough.⁸⁵ The pertussis agglutinin was at first prepared by methods predicated on the assumption that the cells of *H. pertussis* should first be disintegrated to liberate the agglutinin.⁸⁶ Later, reasoning that the agglutinin was a component of the surface of the cells of virulent *H. pertussis* led to the successful attempt to extract surface material directly from the intact bacterial cells.⁸⁶ This surface extraction provided the diagnostic agglutinin in better yield by a simpler procedure than the earlier method.

The pneumococcus capsular polysaccharide used in the Francis test and the pertussis agglutinin, phase 1, used for the skin test for pertussis, are of themselves nontoxic and give allergic skin reactions only as the result of the existence of antibodies

in the skin, present in consequence of earlier infection, vaccination or serum therapy. The pneumococcus or pertussis bacterial cells, since they are of complex composition and appreciably toxic, are not equally suitable for such specific diagnostic tests. The specific somatic surface antigens of the typhoid-paratyphoid-dysentery group are, on the contrary, inherently highly toxic⁸⁷ and are thus not suitable for such specific skin tests.

The Preparation of Vaccines and Immune Serums: The virulence of a pathogenic agent may be defined as its ability to cause disease; virulence is thus defined as synonymous with pathogenicity. Virulence or pathogenicity may be considered as comprising in some instances two factors, invasiveness and toxigenicity. Invasiveness obviously means the micro-organism's capacity to penetrate and subsist within the tissues of the host. Toxigenicity for the purposes of this discussion means the capacity to elaborate an exotoxin, as exemplified by *Corynebacterium diphtheriae*, *Clostridium tetani*, *Cl. botulinum*, *Cl. welchi*, *Bacterium shigae*, *Streptococcus pyogenes* and *Staphylococcus aureus*. Invasiveness and toxigenicity may not always be separable in actual infection; the practical utility of considering these factors separately, however, arises from the fact that the immune mechanisms and therapeutic agents required to combat invasiveness and toxigenicity are distinct. This distinctness arises from the fact that the bacterial components against which the anti-invasive (antibacterial) and the antitoxic defensive mechanism are directed are structurally and chemically distinct.

Anti-Invasive (Antibacterial) Immunity: The ability of a pathogenic agent to establish itself on and to invade its host doubtless depends on the whole complex of relationships between parasite and host: the metabolic requirements of the pathogen in relation to the nutrition and oxygen tension provided in host tissues, the ability of the pathogen to withstand host defensive mechanisms, and so on. Specific active and passive immunity against invasiveness, however, is dependent primarily on the antigens at the surface of the pathogen. The first and essential step in the action of antibodies, whether actively or passively acquired, against the invading pathogenic agent is specific chemical combination with an antigen or antigens at the surface of the pathogenic agent. Agglutination, antibody-complement bactericidal action or phagocytosis by polymorphonuclear or mononuclear⁸⁸ phagocytes may follow as a consequence of this specific union of antibody with surface antigen, depending on the nature of the pathogen and the environing conditions. The antigens of the cell wall of the pathogenic agent in its virulent form are therefore the primary requisite of any diagnostic reagent or vaccine which is to detect or stimulate anti-invasive immunity. Since electron microscopy shows that the cell walls of bacteria and rickettsias form a relatively small fraction of the mass of the cells and since the inner protoplasm may be toxic, these facts have practical implications. It is perhaps not too rash to predict that purified surface antigens will increasingly come into use as diagnostic reagents and even as vaccines for active immunization.

81. Smith, Theobald, and Reagh, A. L.: The Nonidentity of Agglutinins Acting on the Flagella and on the Body of Bacteria, *J. M. Res.* **10**: 89-100 (Aug.) 1903.

82. Bornstein, S.: The State of the Salmonella Problem, *J. Immunol.* **40**: 439-496 (June) 1943.

83. Heidelberger, M., and Avery, O. T.: The Soluble Specific Substances of Pneumococcus, *J. Exper. Med.* **38**: 73-79 (July) 1923. Avery, O. T., and Heidelberger, M.: Immunological Relationships of Cell Constituents of Pneumococcus, *ibid.* **38**: 81-85 (July) 1923.

84. Hissdorf, E. W.; Felton, H. M.; Bondi, A., and McGuinness, A. C.: Intradermal Test for Susceptibility To and Immunization Against Whooping Cough Using Agglutinin from Phase I *H. Pertussis*, *Am. J. M. Sc.* **206**: 421-425 (Oct.) 1943. Felton, H. M., and Hissdorf, E. W.: Clinical Results with the Use of Agglutinin from Phase I *Hemophilus Pertussis* as a Skin Test for Susceptibility to Whooping Cough, *J. Pediatr.* **23**: 259-264 (March) 1943.

85. Hissdorf, E. W., and Kimball, A. C.: Comparison of Various Physical Means of Liberation of the Agglutinin from *H. Pertussis* in Phase I, *J. Immunol.* **39**: 287-295 (Oct.) 1940.

86. Smolens, J., and Mudd, S.: Agglutinin of *Hemophilus Pertussis* Phase I for Skin Testing. Theoretical Considerations and a Simple Method of Preparation, *J. Immunol.* **47**: 155-163 (Aug.) 1943.

87. Weil, A. J.: Progress in the Study of Bacillary Dysentery, *ibid.* **46**: 13-46 (Jan.) 1943. Morgan, W. T. J., and Partridge, S. M.: An Examination of the O Antigenic Complex of Bact. Typhosum, *Brit. J. Exper. Path.* **23**: 151-165 (Aug.) 1942. Perlman, E., Binley, F., and Gobel, W.: Immunochemical Studies on *Shigella Paradyseriae*, *J. Bact.* **47**: 476 (May) 1944, abstract.

88. Mudd, S., McCutcheon, W., and Lucke, B.: Phagocytosis, *Physiol. Rev.* **14**: 210-275 (April) 1934.

The pneumococcus polysaccharide used in the Francis skin test in pneumonia and the agglutinin of *Hemophilus pertussis* used in the diagnosis of susceptibility to pertussis have already been cited as examples of the use of specific surface components for susceptibility tests.

Type specific serologic reactivity, on which specific antibacterial immunity depends, may be determined by configuration either of a carbohydrate or of a protein component. The capsular polysaccharides of the various pneumococcus types are the classic examples of carbohydrate antigens which determine type. The surface somatic proteins ("M substance") of the various types of *Streptococcus pyogenes* are an example of type determination by protein antigens. In the case of the typhoid-paratyphoid-dysentery group, type specificity is determined by a phosphorus-containing polysaccharide-protein complex in which the carbohydrate component is type specific and the protein component is not type specific.⁸² The characteristic antigenic reactivity (and toxicity) of the somatic antigens of this group appear, however, to be a property of the intact phosphorus-containing polysaccharide-protein complex and not of either the isolated carbohydrate or protein component alone.⁸⁷ In all cases known to me, however, the reactive configurations which determine type specificity and antibacterial immunity are peripheral,⁸⁹ i. e. are in the capsule, as in pneumococci, in the bacterial cell wall, as in *Streptococcus pyogenes* and the *Shigellas*, or in the bacterial cell wall and flagella, as in *Eberthella typhosa* and the *Salmonellas*.

Emphasis on the selection of pathogens in fully virulent form as a source of antigens for detecting or producing anti-invasive immunity perhaps requires further elaboration. Evidence is slowly accumulating from many sources to indicate that the specific, pathogenic types of bacteria represent highly differentiated phases which are characteristically found under conditions of active and successful parasitism. These specific differentiated phases may, under favorable conditions, persist in culture. Usually, however, type specificity and pathogenicity tend sooner or later to diminish or be lost under artificial cultivation. Loss of type specificity usually proceeds *pari passu* with loss of an antigenic component at the surface of the parasite, for instance of the capsular polysaccharides of virulent pneumococci, the Vi somatic polysaccharide of virulent *E. typhosa*, the M protein present in the cell wall of virulent *Str. pyogenes*²⁵ or the agglutinin of *Hemophilus pertussis* in phase I;⁹⁰ loss of type specific surface antigen is usually correlated also with loss of invasiveness. Such nonpathogenic phases, which have lost the surface antigens associated with virulence, are obviously unsuited as immunizing agents to protect against invasion.

The ability to elaborate exotoxin (toxigenicity), on the other hand, may persist without relation to loss of type specific surface antigens and of the component of virulence on which depends the ability of the parasite to establish itself on and to invade its host.

Antitoxic Immunity: The diseases which are primarily due to the production of exotoxin are those in which specific biologic prophylaxis and treatment have had their most conspicuous successes. Diphtheria, tetanus and to a less extent scarlet fever are cases in point. The exotoxin elaborated by the growing pathogenic agent passes out of the bacterial cell into the culture medium or host tissue and exerts its toxic action at a distance from its source. In diphtheria and tetanus early neutralization of the exotoxin by specific antitoxin usually suffices to permit recovery, the defensive mechanisms of the host in due course serving to eliminate the parasites themselves. In streptococcal and staphylococcal infection neutralization of the exotoxins does not of itself necessarily suffice to prevent tissue invasion by the streptococci or staphylococci themselves.

Exotoxin is ordinarily harvested from aged cultures in which many or most of the bacterial cells are cytolized. Morton and Gonzalez,⁹¹ however, obtained diphtheria toxin from young cultures of *C. diphtheriae* by sonic disintegration of the bacterial cells. The exact site of formation of toxin by the bacterial cells is not known. Only one type of toxin is known to be produced by *C. diphtheriae* or by *Cl. tetani*, although the cells of the diphtheria or tetanus bacilli occur in several agglutinative types.

Since exotoxins and toxoids as ordinarily dealt with are free from the cells which produced them, and since their relation to the architecture of these cells is unknown, their further discussion would be outside the scope of the present article.

Immunity Against Viruses.—The immune mechanisms which are operative against bacteria and other foreign particles containing antigens are also operative against viruses.⁹² Specific combination of viral antigen and corresponding antibody can be demonstrated *in vitro* by precipitation, agglutination or complement fixation, and *in vivo* by specific neutralization of virus infectivity. The combination of virus and specific antibody has been demonstrated in electron pictures by Anderson and Stanley⁹³ (figs. 49 and 50). The blood clearing mechanism, consisting of the fixed reticulo-endothelial macrophages, the wandering macrophages, the circulating monocytes and polymorphonuclear leukocytes, acting in coordination with antibodies, is operative against viruses. Virus neutralizing antibodies are extremely effective in protecting animals against experimental virus infections. Clinical protection following exposure to various virus diseases may be afforded under appropriate conditions by convalescent human serums. Active immunization or recovery affords some degree of protection against most or all virus diseases. In brief, the classic phenomena of active and passive immunity and allergy are exhibited with respect to viral and rickettsial infections, but with modifications consequent on the obligate intracellular sites of the infecting viruses and rickettsias.

Active and passive humoral immunity (i. e. immunity dependent on antibodies) is of more conspicuous value in diseases due to intracellular parasites if established prior to the onset of clinical symptoms than for the treatment of established infection. The commonly

89. By "peripheral" is meant present in the periphery of the cell, without implication, however, that the component may not be present also in the inner protoplasm of the bacterial cell. It may be emphasized also that antigens of bacterial flagella may be of cardinal importance for diagnostic purposes but have only a very minor role in antibacterial immunity.

90. Flösdorff, E. W.; Dozois, T. F., and Kimball, A. C.: Studies with *H. pertussis*: V. Agglutinogenic Relationships of the Phases, *J. Bact.* **41**: 457-471 (April) 1941. Flösdorff, E. W., and McGuinness, A. C.: Studies with *Hemophilus Pertussis*: VIII. The Antigenic Structure of *Hemophilus Pertussis* and Its Clinical Significance, *Am. J. Dis. Child.* **64**: 43-50 (July) 1942.

91. Morton, H. E., and Gonzalez, L. M.: On the Site of Formation of Diphtheria Toxin, *J. Immunol.* **45**: 63-68 (Sept.) 1942.

92. Extensive data on this point are summarized by Topley, W. W. C., and Wilson, G. S.: Principles of Bacteriology and Immunology, ed. 2, London, 1936, chapter 52.

93. Anderson, T. F., and Stanley, W. M.: A Study by Means of the Electron Microscope of the Reaction Between Tobacco Mosaic Virus and Its Antiserum, *J. Biol. Chem.* **139**: 339-344 (May) 1941.

accepted explanation is that once intracellular parasites (chiefly the rickettsias and viruses) have parasitized their host cells they are no longer accessible to the action of immune serum. This pessimism regarding specific therapy would doubtless be justified if all the susceptible cells which are ultimately affected were parasitized at the same time. However, in a recent article on this subject Stokes⁹⁴ offers evidence that measles may be modified to some extent if sufficient human antibodies are administered in its earliest febrile stage. Topping⁹⁵ presents similar data for experimental animal and for clinical human cases of Rocky Mountain spotted fever. Stokes emphasizes the importance of earlier diagnosis of such diseases so that the therapeutic as well as prophylactic possibilities of such newly available preparations as Cohn's human γ -globulin concentrate may be realized.

Another phenomenon of acquired resistance has most recently been proved to exist in a number of viral infections. This phenomenon of acquired cellular resistance is quite outside the classic phenomena of immunity as described in infections caused by extracellular parasites. Whether or not this phenomenon may ultimately prove to be coextensive with intracellular parasitism and what its practical implications may be it is as yet too early to predict. Its possible importance as well as its relative unfamiliarity suggest discussion of the interference phenomenon or the phenomenon of acquired cellular resistance in considerable detail.

The Interference Phenomenon in Viral Diseases; Acquired Cellular Resistance.—A growing body of evidence shows the existence in viral diseases of a phenomenon involving a specific relationship between viruses and host cells, and specific interference between related viruses in the parasitizing of their host cells. The challenging question of the extent to which this phenomenon may be related to active resistance to superinfection during infectious diseases due to intracellular parasites, in carrier states and following recovery from such diseases is worthy of much consideration.

The most clearcut instances of the interference phenomenon consist in the protection, within strict limits of time, dosage and other factors, of host cells ordinarily susceptible to a virulent virus by the presence of a related⁹⁶ virus. The protection may be afforded by a virus of such low virulence with respect to the host cells in question that minimal or even no symptoms are observable; the protective action may be initiated by the related virus prior to or simultaneously with infection with the virulent virus. This phenomenon of interference between related viruses has been described with respect to animal, plant and bacterial (bacteriophage) viruses.

Interference Between Animal Viruses: Magrassi⁹⁷ first observed in Doerr's laboratory in 1935 a phenomenon of immunity against superinfection which was not satisfactorily explicable in terms of humoral immunity. Magrassi worked with strains of herpes virus,

certain of which were capable and certain incapable of causing encephalitis in rabbits. Following corneal infection with a nonencephalitogenic strain the rabbits did not develop any clinical signs of encephalitis; nevertheless the virus could be demonstrated to be present in the brain on the sixth day following intra-corneal inoculation; from the fourth day after corneal inoculation the animal was immune to direct cerebral inoculation even of large doses of encephalitogenic virus. Magrassi similarly demonstrated that, from five to ten days after intracutaneous inoculation of herpes virus, rabbits were immune to cerebral reinoculation with the virus; the reinoculated virus indeed disappeared rapidly from the brain, and this disappearance was not explicable as a neutralization by antibodies. Magrassi's essential observations were confirmed by Doerr and Seidenberg,⁹⁸ and the significance of these and similar experiments were discussed by Doerr and Kon.⁹⁹

Hoskins¹⁰⁰ in 1935 observed that *Macacus rhesus* monkeys injected subcutaneously or intraperitoneally with mixed pantropic and neurotropic strains of yellow fever virus were protected by the neurotropic strain from fatal infection by the pantropic strain. The same protective effect against pantropic virus was afforded if the neurotropic strain was injected separately up to twenty hours after the pantropic strain; if injection of the pantropic virus preceded injection of the neurotropic strain by forty-eight hours, however, there was no protection and the animals died of infection with the pantropic strain.

These observations were confirmed and extended by Findlay and MacCallum.¹⁰¹ Protection against pantropic yellow fever virus was afforded by concurrent injection of neurotropic yellow fever virus in several host species. Rift Valley fever virus also afforded some protection to monkeys against pantropic yellow fever virus. Neurotropic yellow fever virus in turn protected mice against Rift Valley fever virus. The authors offered as a possible explanation of these instances of interference of one virus with the pathogenic action of another virus the hypothesis "that when certain cells are already occupied by actively multiplying virus particles they cannot be invaded by certain other virus particles."

Jungeblut and Sanders¹⁰² similarly demonstrated interference between a mouse adapted and a monkey strain of poliomyelitis virus. The presence of murine virus in the monkey brain was shown to interfere critically with the propagation of virulent monkey strains in the same animal. This effect could be produced therapeutically up to four days after intracerebral inoculation of the virulent virus. Thus "among a total of 88 monkeys which had received murine virus between the first and fifth day of the disease, 51 monkeys, or more than half (57 per cent), failed to show paralytic symptoms, while in a group of 50 untreated controls

94 Stokes, J., Jr.: *The Use of Immune Bodies in the Treatment of Certain Infectious Diseases (Virus and Rickettsial Diseases) Caused by Intracellular Parasites, with Emphasis on the Need for Early Diagnostic Criteria of Infection*, Yale J. Biol. & Med. 16: 415-424 (May) 1944.

95 Topping, H. H.: *Rocky Mountain Spotted Fever: Further Experience in the Therapeutic Use of Immune Rabbit Serum*, Pub. Health Rep. 58: 757-775 (May 14) 1943.

96 The term "related" is used without for the present attempting precise definition. In many but definitely not in all cases in which data are available, interfering strains are serologically cross reactive. Probably all that should be implied at this time is that interfering viruses parasitize the same host cells in some competitive manner.

97 Magrassi, F.: *Studi sull' infezione e sull' immunita da virus erpetico*, Ztschr. f. Hyg. u. Infektionskr. 117: 501-528 (Nov.), 573-620 (Dec) 1935.

98 Doerr, R., and Seidenberg, S.: *Die Konkurrenz von Virusinfektionen im Zentralnervensystem (Phänomen von F. Magrassi)*, Ztschr. f. Hyg. u. Infektionskr. 119: 135-165 (Jan) 1937.

99 Doerr, R., and Kon, M.: *Schieneninfektionen, Schienensensibilisierung und Konkurrenz der Infektionen im Z. N. S. beim Herpesvirus*, Ztschr. f. Hyg. u. Infektionskr. 119: 679-705 (July) 1937.

100 Hoskins, M.: *A Protective Action of Neurotropic Against Viscerotropic Yellow Fever Virus in Macacus Rhesus*, Am. J. Trop. Med. 15: 675-680 (Nov.) 1935.

101 Findlay, G. M., and MacCallum, F. O.: *An Interference Phenomenon in Relation to Yellow Fever and Other Viruses*, J. Path. & Bact. 44: 405-424 (March) 1937.

102 Jungeblut, C. W., and Sanders, M.: *Studies of a Murine Strain of Poliomyelitis Virus in Cotton Rats and White Mice*, J. Exper. Med. 72: 407-436 (Oct.) 1940; *Studies in Rodent Poliomyelitis. V. Interference Between Murine and Monkey Poliomyelitis Virus*, ibid. 76: 127-142 (Aug) 1942.

only 2 monkeys (4 per cent) escaped the disease." In seeking an explanation the authors point out that both murine and monkey strains of the virus "possess the same affinity for the anterior horn cell which constitutes the selective seat of the poliomyelitic lesion . . . A 'blockade' of susceptible cells by nonparalyzing murine virus might render these cells temporarily impregnable to an attack of paralyzing monkey virus because the orderly function of certain enzyme systems, necessary for successful propagation of monkey virus, has conceivably been disturbed by previous contact with murine virus."

Protection of hamsters against a hamster adapted strain of poliomyelitis virus by previous inoculation with various other strains of poliomyelitis virus has recently been described by Dalldorf and Whitney:¹⁰⁰ "The protection is well developed within six days and persists for from six to eight weeks." As in other instances, heat inactivated virus does not afford this protection; . . . "the time relationships are important in showing that the phenomenon is an interference rather than cross immunity."

Reciprocal interference between strains of influenza virus grown in tissue cultures has been demonstrated by Andrewes:¹⁰⁴

When a strain of influenza A is given good opportunity to multiply in a tissue culture of the Maitland type, that culture is thereby rendered incapable of supporting the growth of another strain of influenza added subsequently. This cannot be because of any formation of antibody, nor is there any change in pH as compared with uninoculated cultures.

The cells of the infected culture would still support growth of the unrelated virus of lymphogranuloma venereum. "When two strains of influenza A virus were added to a tissue culture simultaneously but in widely differing amounts, the one present in larger quantity suppressed the growth of the other."

The Henles,¹⁰⁵ studying the propagation of influenza A virus in the chorioallantoic membrane of embryonated eggs, have demonstrated interference by homologous virus partially inactivated by aging or by ultraviolet irradiation:

Similar interference experiments conducted in mice by the intranasal injection of partially inactivated virus preparations, followed five hours later by the active agent, have given results indicating that the same phenomenon may be demonstrated in this species. Protection against as much as 250 50 per cent mortality doses was noted

Interrelationships between classic immunity and the phenomenon of acquired cellular resistance are well brought out by the studies of Morgan and Olitsky,¹⁰¹ Morgan, Schlesinger and Olitsky¹⁰⁷ and Schlesinger, Olitsky and Morgan.¹⁰⁸ A degree of active immunity

can be induced in animals by vaccination with formaldehyde inactivated eastern equine encephalomyelitis virus or western equine encephalomyelitis virus. In such vaccinated animals the degree of resistance to intracerebral inoculation of homologous virus is correlated with the titer of neutralizing antibody in the serum and with the neutralizing capacity of the cerebrospinal fluid.¹⁰⁷ Animals vaccinated with formaldehyde inactivated eastern equine encephalomyelitis virus are not immunized against western equine encephalomyelitis virus, nor are those vaccinated with western equine encephalomyelitis virus immune to eastern equine encephalomyelitis. This is the familiar picture of specific active immunity.

If now such vaccinated guinea pigs were injected intracerebrally with 1 to 1,000 minimum lethal dose of homologous virus a steep rise in temperature occurred, first observed two hours after inoculation and persisting for about twenty-four hours; while in control animals fever lasted until prostration or death, in immune animals the temperature dropped after twenty-four to thirty hours and remained normal thereafter.¹⁰⁸ Guinea pigs two weeks after this abortive infection with western equine encephalomyelitis virus resisted intracerebral reinoculation with 10 or 1,000 minimum lethal doses of eastern equine encephalomyelitis virus. Similar observations were made in rabbits. Animals thus rendered resistant to reinoculation intracerebrally with either homologous or heterologous virus were not resistant to peripheral reinoculation with heterologous virus, which circulated in the blood stream as in normal animals. Animals vaccinated and then recovered from an abortive infection with western equine encephalomyelitis exhibited also an increased resistance to intracerebral inoculation with Theiler's virus. This, then, is the picture of the interference phenomenon—an induced, transient resistance to superinfection of cells which would normally be susceptible, this acquired cellular resistance not being necessarily limited to serologically cross reactive types of intracellular parasite

The interference phenomenon has recently been investigated in detail by Ziegler and Horsfall,¹⁰⁹ Ziegler, Lavin and Horsfall¹¹⁰ and the Henles,¹¹¹ using embryonated hen's eggs inoculated into the allantoic sac with influenza virus. Reciprocal interference has been clearly demonstrated between strains of influenza A, influenza B and swine influenza virus. These strains are related in their tropism for tissue but are not serologically cross reactive. Suppression of reproduction of active virus was obtained by the presence of active heterologous virus or of homologous or heterologous virus rendered partially or completely noninfective by carefully quantitated ultraviolet radiation or by prolonged storage at low temperature. Reproduction of active virus could be suppressed by introduction of noninfective virus as long as twelve hours after inoculation of the active virus.

103 Dalldorf, G. and Whitney, E.: A Further Interference in Experimental Poliomyelitis, *Science* **98**: 477-478 (Nov. 26) 1943.

104 Andrewes, C. H.: Interference by One Virus with the Growth of Another in Tissue Culture, *Brit. J. Exper. Path.* **23**: 214-220 (Aug.) 1942

105 Henle, W., and Henle, G.: Interference of Inactive Virus with the Propagation of Virus of Influenza, *Science* **98**: 87-89 (July 23) 1943

106 Morgan, I. M., and Olitsky, P. K.: Immune Response of Mice to Active Virus and to Formalin Inactivated Virus of Eastern Equine Encephalomyelitis, *J. Immunol.* **42**: 445-454 (Dec.) 1941

107 Morgan, I. M.; Schlesinger, R. W., and Olitsky, P. K.: Induced Resistance of the Central Nervous System to Experimental Infection with Equine Encephalomyelitis Virus: I. Neutralizing Antibody in the Central Nervous System in Relation to Cerebral Resistance, *J. Exper. Med.* **76**: 357-369 (Oct.) 1942.

108 Schlesinger, R. W.; Olitsky, P. K., and Morgan, I. M.: Observations on Acquired Cellular Resistance to Equine Encephalomyelitis Virus, *Proc. Soc. Exper. Biol. & Med.* **54**: 272-273 (Dec.) 1943

109 Ziegler, J. E., Jr., and Horsfall, I. L.: Interference Between the Influenza Viruses: I. The Effect of Active Virus on the Multiplication of Influenza Viruses in the Chick Embryo, *J. Exper. Med.* **79**: 361-377 (April) 1944.

110 Ziegler, J. E., Jr.; Lavin, G. I. and Horsfall, I. L.: Interference Between the Influenza Viruses: II The Effect of Virus Rendered Noninfective by Ultraviolet Radiation on the Multiplication of Influenza Viruses in the Chick Embryo, *J. Exper. Med.* **79**: 379-400 (April) 1944

111 Henle, W., and Henle, G.: Interference Between Inactive and Active Viruses of Influenza: I The Incidental Occurrence and Artificial Induction of the Phenomenon, *Am. J. M. Sc.* **207**: 705-716 (June) 1944, Interference Between Inactive and Active Viruses of Influenza: II Factors Influencing the Phenomenon, *ibid.* **207**: 717-732 (June) 1944

Interference Between Plant Viruses.—The literature on acquired immunity of plants to viral diseases has been reviewed by Price.¹¹² Many plants recover symptomatically from virus disease but remain carriers of viable virus. Such plants are immune to reinoculation of the same or related viruses but not to unrelated viruses:

Plants recover after an acute attack by production of shoots or leaves which appear healthy or show only mild symptoms of disease, which still harbor virus and which are refractory to infection with the virus in question but not to infection with unrelated viruses.

With respect to cross immunity, it has been shown with numerous groups of viruses that plant tissues invaded by one strain of a virus are protected from infection with another strain of the virus but are susceptible to infection with unrelated viruses. The immunity appears to be closely associated with presence of virus in the immune tissues, since there is no evidence that virus free tissues of infected plants are immune. The cross immunity reaction has proved useful for differentiation and classification of plant viruses.

Kunkel¹¹³ records an instance in which this interference between plant viruses was of curative value during the first days of infection. A mild strain of tobacco mosaic virus was used to immunize tomato plants against a lethal strain of tobacco mosaic virus which quickly kills unprotected tomato plants. The tomato plants were saved from death or serious injury when they were inoculated with the mild virus within three days after infection.

It is to be emphasized that nothing equivalent to antibodies and therefore no natural humoral mechanism of immunity has been demonstrated in plants. It is true that specific neutralization of the infectivity of plant viruses by immune serums prepared in animals can be demonstrated experimentally; this, however, is definitely an artificial procedure. Price presents interesting considerations suggesting that the type of specific acquired immunity under discussion may be common to animals and plants alike.

Interference Between Bacterial Viruses (Bacteriophages).—The lysis of bacteria by bacteriophage may be considered as a virus infection in which the susceptible bacterial cell is the host and the bacterial virus or bacteriophage particle is the parasite. The accessibility of the bacterial cell to observation, the simplicity of the host (simplicity at least as compared to animal and plant hosts) and the short time within which the parasitic cycle is complete make bacteriophage lysis peculiarly suitable for definitive analysis.

Interference between types of bacteriophage active against a single strain of *E. coli* has been demonstrated and analyzed by Delbrück and Luria,¹¹⁴ Luria and Delbrück¹¹⁵ and Luria, Delbrück and Anderson.⁴² Two different types of bacteriophage, α and γ , each independently produce characteristic lysis of the susceptible strain of colon bacilli. In mixed infection under suitable conditions, however, lysis is exclusively of the γ type, and lysis by a phage is completely suppressed.

Analysis of lysis by these bacteriophage strains reveals that the first step is adsorption of bacteriophage particle or particles on the surface of the bacterial cell. Unless phage is present in great excess there is no interference between the two phage strains in regard to this primary adsorption; each strain is adsorbed at a rate dependent on its own affinity for the host cell and the experimental conditions.

"The second phase of the life cycle is the multiplication of the virus in the cell. After the bacterial cell has adsorbed a virus particle, it retains normal appearance for a while; then, suddenly, the newly formed virus particles are liberated. In most cases the cell is lysed at the same moment. . . . After this the newly liberated virus particles will become adsorbed to other bacteria still present in the culture." In infection by a mixture of the two phage strains the chain of events between adsorption of virus on cell, through multiplication of the virus, to liberation of new phage particles is dominated by the γ phage. In lysis by the γ phage the latent period between adsorption and liberation of the new phage particles is twenty-one to twenty-five minutes and on the average about 135 new phage particles are released from each cell lysed. These characteristic constants are not altered by the presence in the mixed infection of α phage particles, and the new phage particles produced are exclusively of the γ type. The α phage alone produces lysis in thirteen to seventeen minutes. Yet the suppression of the growth of α phage may be brought about even when γ phage is added several minutes after infection by α phage.

Luria and Delbrück¹¹⁵ found that the ability of γ phage to suppress the growth of α phage could be demonstrated even after the γ bacteriophage was partially inactivated by ultraviolet radiation, although heat inactivated phage had lost this ability. Analysis of the quantitative data led to the conclusion that the adsorption of one ultraviolet inactivated γ particle on the bacterial cell was sufficient to inhibit the growth of virus α :

The ultraviolet inactivated virus γ also shows the capacity of inhibiting the growth of the sensitive bacteria. These are not lysed but deprived of the ability to divide. The number of bacterial cells thus affected corresponds to that of the cells in which the growth of the virus α is inhibited; the two actions evidently are manifestations of the same phenomenon. The suppression of bacterial growth must be due to inhibition by virus γ of some fundamental step in the synthetic processes of the bacterial life cycle.

A bacterium-phage relationship suggestive of the resistant carrier state which is so familiar in animal and plant pathologic conditions has been described by Burnet and Lush:¹¹⁶

A bacteriophage (C) acting on the nonpathogenic white coccus SF is characterized by the unusual frequency with which it provokes the appearance of resistant forms. Each plaque shows a central growth of resistant culture, and suitable experiments indicate that under the usual conditions of growth 10 or 20 per cent of effective contacts between phage and susceptible bacterium result in the appearance of resistant lysogenic variants, the remainder initiating lysis in classic fashion. The resistant culture shows no gross evidence of lytic action on agar but in broth culture liberates considerable amounts of phage.

116. Burnet, F. M., and Lush, D.: Induced Lysogenicity and Mutation of Bacteriophage Within Lysogenic Bacteria, *Australian J. Exper. Biol. & M. Sc.* 14: 27-38 (March) 1936.

112. Price, W. C.: Acquired Immunity from Plant Virus Diseases, *Quart. Rev. Biol.* 15: 338-361 (Sept.) 1940.

113. Kunkel, L. O.: New Views in Virus Disease Research, chapter IV in *Science in Progress*, New Haven, Yale University Press, 1939, pp. 118-121.

114. Delbrück, M., and Luria, S. E.: Interference Between Bacterial Viruses: I. Interference Between Two Different Viruses Acting on the Same Host, and the Mechanism of Virus Action, *Ann. N. Y. Acad. Sci.* 1: 111-141 (Oct.) 1942.

115. Luria, S. E., and Delbrück, M.: Interference Between Inactivated Bacterial Virus and Active Virus of the Same Strain and of a Different Strain, *Arch. Biochem.* 1: 207-218 (Dec.) 1942.

Concerning the change of the host bacterial cell from normal susceptible to resistant carrier the authors say:

The production of the resistant lysogenic strain SF/C provides a clearcut example of the positive induction of change in bacterial character by the action of a bacteriophage. In this instance the alternative of selection by phage from preexistent variants in the population submitted to lysis is definitely excluded. The rapidity with which the change is induced is noteworthy. Within an hour of contact with phage C the surface of the bacterium has changed so that it no longer adsorbs either phage C or C' and becomes insusceptible to their action. This changed character is then transmitted indefinitely to its descendants. It is not possible to say whether this surface change results from an altered genetic constitution of the bacterium or is directly induced by the associated phage at each generation.

White¹¹⁷ discovered a similar case in cholera bacteriophagy. A phage strain of small lytic power "renders the originally sensitive vibrio forthwith and in perpetuity resistant to the most active" phage strain. The resistant bacteria are lysogenic, i. e. are carriers of phage. Concerning mechanism, White writes "The obvious and highly probable explanation is that the less lytic phage, lacking nothing in combining vigor, establishes itself on the 'phage receptors' of the bacterium, forbidding entry to its more destructive confrère. . . ."

These data on the interference phenomenon in animals, plants and bacteria have been presented in what may seem disproportionate detail because of my belief that they may lead to the threshold of a more fundamental understanding of the relationship of the parasite to the parasitized host cell in many diseases caused by intracellular parasitic agents. They may be considered relevant to a discussion of the morphology of micro-parasites because a critical relationship between components of the parasites and components of the parasitized host cells is involved. In some instances at least the first step of this critical relationship, the adsorption of virus to host cell, may be shown to depend on a specific correspondence in chemical configuration between the virus and components of the host cell surface analogous to that between antibody and cell surface antigen.

The first step in the action of bacteriophage particle on susceptible bacterial cell is specific adsorption of the phage particle to the surface of the bacterial cell. This adsorption must depend on a lock to key correspondence between the pattern of certain molecular configurations on the surface of the bacterial cell and the pattern of configurations on the surface of the phage particle.¹¹⁸ The adsorption of phage to a specific receptor site on the bacterial cell is analogous to the combination of antibody with antigen at the surface of the bacterial cell. Each depends on a specific surface configurational correspondence.

The specificity of the phage receptor and the antigen sites may be closely similar. Thus Schiff and Bornstein¹¹⁹ describe a phage specific for the somatic antigen

IX of the Kauffmann-White table of *Salmonella* antigens. This antigenic configuration occurs in *Eberthella typhosa* and in group D of the *Salmonellas*; bacterial species whose surface contains configuration IX are with few exceptions susceptible to this particular phage and species lacking IX are not, again with certain exceptions. Another phage lyses bacterial species containing the flagellar antigen *d* which occurs in *E. typhosa* and in certain *Salmonella* species. A similar phage for R somatic antigen is described by the same authors.¹¹⁹ On the other hand the Vi phages described by Craigie and Brandon¹²⁰ and Craigie and Yen¹²¹ have permitted the subdivision of the single serologic V type of *E. typhosa* into eighteen types and subtypes¹²¹ as determined by phage susceptibility. Finally within the species *Streptococcus pyogenes*¹²² the specificity of serologic types is narrower than that of the grouping determined by phage susceptibility. Strains of dysentery bacteriophage are available also which lyse strains of several types within the species *Shigella paradysenteriae*. The sites on the bacterial cell with which phages combine may thus be more or less specific or equally specific with the sites at which given antibodies combine. In each case the combination must be critically dependent on molecular configurations in the bacterial cell surface.

Direct evidence that the combination between bacteriophage and susceptible cell is also dependent on the state of the surface of the bacteriophage particle is afforded by the recent study of Kalmanson and Bronfenbrenner.¹²³ These investigators have shown that adsorption of phage particle to bacterial cell can be prevented by previous combination of phage with antiphage serum and that the phage activity can be quantitatively restored by digesting away the antibody coating with the proteolytic enzyme papain. The phage particle coated with antiphage serum cannot combine with the bacterial cell receptors; removal of the antibody from the phage particle surface enables it to combine with and cause lysis of its bacterial host cell.

The chain of events following adsorption of phage particle to susceptible cell surface leads to multiplication of the phage and usually to lysis of the bacterial host cell. d'Herelle¹²⁴ presents evidence suggesting that the phage may elaborate lysins which are distinct from the components which determine adsorption to the susceptible cell. However, the mechanism of phage multiplication¹²⁵ and of bacterial lysis have not yet been clearly analyzed and will not be considered further in this report.

In the work cited a beginning has been made in discovering the all important events that are involved in the parasitization of a host cell by an intracellular parasite. In the case of bacteriophagy at least it seems clear that the initial event is a specific adsorption of the phage particle to bacterial host cell, this combination,

117. White, P. B.: Lysogenic Strains of *V. Cholerae* and the Influence of Lysozyme on Cholera Phage Activity, *J. Path. & Bact.* **44**: 276-278 (Jan.) 1937.

118. This sentence is obviously an interpretation by the author, to whom, however, the conclusion seems almost a rational necessity. Experimentally it rests on the analogy between the specificities of the phage-bacterial cell and the antibody-bacterial cell relationships. That the antibody-antigen combination depends on specific surface configurational correspondence is documented by a large and detailed body of knowledge.

119. Schiff, F., and Bornstein, S.: Hemolytic Effect of Typhoid Cultures in Combination with Pure Lines of Bacteriophage, *J. Immunol.* **39**: 361-367 (Oct.) 1940.

120. Craigie, J., and Brandon, K. F.: Bacteriophage Specific for the O Resistant V Form of *B. Typhosus*, *J. Path. & Bact.* **43**: 233-248 (Sept.) 1936.

121. Craigie, J., and Yen, C. H.: The Demonstration of Types of *B. Typhosus* by Means of Preparations of Type II Vi Phage, *Canad. Pub. Health J.* **29**: 448-463 (Sept.) 1938.

122. Evans, A.: Studies in Hemolytic Streptococci: II. *Streptococcus pyogenes*, *J. Bact.* **31**: 611-624 (June) 1936.

123. Kalmanson, G. M., and Bronfenbrenner, J.: Restoration of Activity of Neutralized Biologic Agents by Removal of the Antibody with Papain, *J. Immunol.* **47**: 387-407 (Nov.) 1943.

124. d'Herelle, F.: Phénomène de la guérison dans les maladies infectieuses, Paris, 1938.

125. A beginning of analysis of phage multiplication has been made by T. F. Anderson: Virus Reactions Inside of Bacterial Host Cells, *J. Bact.* **47**: 113 (Jan.) 1944; abstract.

like that between antigen and antibody, being determined by specific configurational relationships. This adsorption of phage particle is followed by profound alterations in the metabolic events which occur within the parasitized cell. Some at least of the consequences have been detected: 1. The host cell may become altered in such a way as to make it refractory to superinfection with similar or competing virus particles (acquired cellular resistance—the interference phenomenon). 2. Multiplication of the bacterial host cell may be arrested. 3. Multiplication of the virus within the host cell may occur without lysis (lysogenic strains). 4. Multiplication of the virus within the host cell followed by lysis may occur.

To what extent may the relationship of bacteriophage particles to their bacterial host cells be regarded as affording a clue to the relationship of virus particles to susceptible cells of higher animals and plants? Obviously this question can now be answered in only the most tentative way. The analogies between the phenomena of acquired cellular resistance (interference phenomenon) as exhibited in viral infections of animals and plants and of bacteria seem to me very suggestive, indeed. Particularly suggestive too is the recent study by Hirst¹²⁶ of the adsorption of influenza virus on cells of the respiratory tract.¹²⁷ The analogies between the protective action of serum in prophylactic passive immunization (e. g. against measles) and the reversible inactivation of phage by immune serum¹²⁸ is suggestive.

Although the phenomenon of acquired cellular resistance to superinfection would appear to be a consequence of the fundamental mechanisms of reproduction within their host cells of many animal, plant and bacterial viruses, interference does not occur in all instances of viral infection. Thus numerous cases are on record of the infection of individual cells by more than one virus,¹²⁹ evidenced by the demonstration, for instance, of specific intranuclear and cytoplasmic inclusion bodies within the same cell. The changes consequent on the parasitization of a cell, in some but not all instances, therefore render that cell refractory to a second intracellular parasite. Although this acquired cellular resistance is a phenomenon separate from humoral immunity, the two phenomena may supplement each other in the total defense against an intracellular parasitic disease.

Is the phenomenon of acquired cellular resistance limited to viral infections? Diseases due to rickettsias have not as yet been investigated with reference to the existence or nonexistence of the interference phenom-

non, as far as I am aware; observations which may be interpreted as suggestive of the possible occurrence of such a phenomenon in rickettsial diseases are recorded in Pinkerton's review.⁴⁴

Phases in which bacterial pathogens survive and even multiply within host cells are not unknown in diseases of bacterial causation, e. g. leprosy and the early stages of tuberculosis. In tuberculosis the physiologic behavior and even the morphology of mononuclear phagocytic cells is altered by ingestion of tubercle bacilli and their products, as well shown in the thorough investigations of Lurie.¹²⁰ Such cells may acquire an increased metabolic activity, as evidenced by increased rate of division and increased rate of phagocytosis, and an increased capacity to destroy tubercle bacilli. Comparison of this altered physiologic behavior with the phenomenon of acquired cellular resistance to intracellular parasitization would be purely speculative at this time, however.

SUMMARY

Electron micrographs of the simplest parasitic agents of disease have afforded new insight into their structure. Bacteria and rickettsias are shown to have a simple cellular organization. The continuity of bacterial groupings, the shape and structural integrity of the individual bacterial cell are dependent on a well defined bacterial cell wall. This cell wall is in the solid state and may maintain its essential form even after injury to the bacterial cell. Within the cell wall is the bacterial protoplasm with its limiting protoplasmic membrane; only the protoplasm and protoplasmic membrane are seen in ordinary microscopic preparations. The protoplasm is either a sol or a gel which may be readily solvated; it may contain more or less well defined areas of greater density. Certain animal viruses and bacterial viruses have also been demonstrated to have simple cellular organization. Plant viruses thus far studied are nucleoproteins without cellular organization.

Increase in parasitic habit among bacteria is in general correlated with loss of metabolic independence, with dependence on growth accessory substances furnished by the host. The capacity to reproduce outside the host's cells is in general retained by pathogenic bacteria, however. Rickettsias and viruses can reproduce only within their host cells, apparently through diversion of metabolic mechanisms of the host cells.

Classic mechanisms of active and passive immunity are operative with respect to bacteria, rickettsias and animal viruses. Antigens present in the periphery of the parasite (bacterial capsule or cell wall) and the antibodies corresponding to these peripheral antigens are determinative with respect to humoral anti-invasive immunity. Exotoxins are metabolites which are specifically neutralizable by antitoxins. In infections due to viruses a phenomenon of acquired resistance of parasitized host cells to superinfection (the interference phenomenon) may occur. This phenomenon is separate from but may supplement the mechanisms of humoral immunity. Whether or not the interference phenomenon occurs in rickettsial diseases remains to be investigated.¹²⁰

126. Hirst, G. K.: Adsorption of Influenza Virus on Cells of the Respiratory Tract, *J. Exper. Med.* **78**: 99-109 (Aug.) 1943.

127. Hirst's discussion of these important experiments, which should be consulted in detail, contains the following paragraph: "While the data are meager as yet, it is tempting to formulate a tentative hypothesis as to the possible mechanism of the early stages of influenza virus infection of the respiratory cell. It may not be sufficient merely for an inhaled virus particle to come in contact with any point on a susceptible cell, and it may be necessary for it to become attached to a specific receptor substance to gain entrance. Before the virus can infect, it may also have to alter or destroy this receptor substance by means of an enzyme in order to pave the way for penetration and parasitism of that cell. Once the receptor substance is destroyed the virus becomes more firmly bound, parasitizes the cell, multiplies and again appears free in the lung, making possible spread of infection by contiguity. Since the close correlation has been demonstrated between the neutralizing and agglutinating-inhibiting power of various human sera, it may be that neutralization (in mice) consists mainly of covering over that portion of the virus which ordinarily attaches itself to the receptor substance."

128. Syverton, J. T., and Berry, G. P.: Multiple Virus Infection of Individual Host Cells, *Am. J. Path.* **14**: 638-654 (Sept.) 1938; abstract. Syverton, J. T., and Berry, G. P.: Superinfection in Virus Induced Tumors, *Science* **80**: 411 (Nov. 5) 1937. Anderson, K.: Dual Virus Infection of Single Cells, *Am. J. Path.* **18**: 577-583 (July) 1942. Wollmann, O. J., Jr.: Generalized Vaccinia with Dual Virus Infection: A Case Report, *Am. J. Path.* **20**: 173-177 (Jan.) 1944.

129. Lurie, M. B.: Studies on the Mechanism of Immunity in Tuberculosis: The Fate of Tubercle Bacilli Ingested by Mononuclear Phagocytes Derived from Normal and Immunized Animals, *J. Exper. Med.* **75**: 247-268 (March) 1942.

130. Relationships of the microbiologic parasites to chemotherapy, and the possibilities of developing a chemotherapy against intracellular parasites, will be discussed in a section of this report to follow.

THE JOURNAL OF THE
AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO 10, ILL.

Cable Address - - - "Medic, Chicago"

Subscription price - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new, always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter

SATURDAY, NOVEMBER 4, 1944

THE NOBEL PRIZE AWARDS

Announcement from Stockholm indicates that the 1943 and 1944 Nobel prizes in physiology or medicine have been awarded to four investigators, all of whom are now in the United States and three of whom are Americans. The prize for 1939 was the last previously awarded and was offered to Gerhard Domagk, a German, for his discovery of the use of sulfamidamide in medicine. He subsequently informed the Nobel Prize Committee that the ban of the German government on the acceptance of Nobel prizes prevented him from accepting the award.

The 1943 award was made to Drs. Edward A. Doisy, professor of biochemistry at the St. Louis University School of Medicine, and Henrik Dam of Copenhagen, who is now assistant professor of biochemistry at the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., for their fundamental investigations on the chemical nature of vitamin K. Editorials in THE JOURNAL have repeatedly discussed this contribution and have often emphasized its significance. Vitamin K was discovered and named by Dr. Dam in 1935, when he observed in newly hatched chicks a fatal hemorrhagic diathesis which could be cured or prevented by the administration of a nonsaponifiable nonsterol fraction of hog liver or alfalfa. Later it was observed that the delayed clotting time of the blood was due to a low prothrombin content. The work of Doisy showed that there are at least two naturally occurring substances which have similar physiologic properties, and they are now called vitamins K₁ and K₂. These investigations have led to the use of vitamin K in obstructive jaundice, in which it has been shown to have an extraordinary protective effect against hemorrhages. It is also used in the hemorrhagic states associated with ulcerative colitis, sprue, celiac disease and the hemorrhagic state associated with primary hepatic disease and in the treatment of the physiologic hypoprothrombinemia of the newborn which exists during the first week of life. It is now almost routine to give this vitamin by injection to a woman during labor so that the newborn infant

will have a normal amount of prothrombin in the circulating blood. The drug may also be given directly to the newborn infant.

The 1944 award was presented to Drs. Joseph Erlanger, professor of physiology at Washington University School of Medicine, St. Louis, and Herbert Spencer Gasser, director of the Rockefeller Institute, New York, for their studies on the function of individual nerves. Their contributions to a knowledge of the electrophysiology of nerves using the cathode ray oscillograph have yielded information of great importance in understanding the mechanism of action of the nerves. Fundamentally, Gasser and Erlanger showed that the speed of conduction is correlated with the size of the axon. The greater the diameter of the whole axon, the greater the speed of conduction. The largest fibers are motor and are therefore stimulated more easily and carry the impulse with greater speed. For instance, the sensory roots contain large, medium and fine fibers and in the order given carry the sensations of touch, pressure, pain and temperature. Studies made on conduction indicate, for instance, that cocaine will abolish sensation in the order of pain, temperature and touch, while pressure will affect sensation in the reverse order.¹

This recognition of the contribution of the United States to medical research cannot but arouse a feeling of great pride in the physicians and in the research institutions of our country. The annual prizes are worth about \$29,000 and will be divided among the winners.

"PRINCIPLES OF A NATION-WIDE
HEALTH PROGRAM"

Last week some physicians in the United States received from the Committee on Research in Medical Economics of New York the galley proofs of a proposed pamphlet to be called "Principles of a Nation-Wide Health Program." The report comes with twenty-nine sponsors, who are said to have had several meetings and conferences. The expenses of the conferences and the publication were met by gifts contributed for this purpose. The physicians who participated in this planning conference included Ernst P. Boas, Allan M. Butler, Hugh Cabot, Nathaniel W. Faxon, Channing Frothingham, Alan Gregg, John P. Peters and Kingsley Roberts. Most of these names are familiar to the medical profession through their association with what was once known as the Committee of 400. Their points of view have been widely publicized again and again.

1. Erlanger, J. and Gasser, H. S. *Electrical Signs of Nervous Activity*, Philadelphia, University of Pennsylvania Press, 1937. Gasser, H. S., and Erlanger, J. The Role Played by the Sizes of the Con- stituent Fibers of a Nerve Trunk in Determining the Form of the Action Potential Wave, *J. Physiol.* 80: 522, 1927; The Role of Fiber Size in the Establishment of a Nerve Block by Pressure or Cocaine, *Am. J. Physiol.* 88: 581, 1929; *Electrical Signs of Nervous Activity*, London, Oxford University Press, 1937. Gasser, H. S.: The Control of Excitation in the Nervous System, *Harvey Lectures* 32: 169, 1937. Forbes, A. Symposium on the Synapse, *J. Neurophysiol.* 2: 41, 1939.

Among those who are not physicians and who apparently had leadership in the movement were I. S. Falk, attached to the Social Security Board; Michael M. Davis, who to all intents and purposes is the Committee on Research in Medical Economics; C.-E. A. Winslow of New Haven, Conn., and Edwin E. Witte of Madison, Wis. Finally there were several physicians of the U. S. Public Health Service and several teachers of economics. Without reading the "Principles of a Nation-Wide Health Program" developed by this group, any well informed physician would know the nature of the recommendations.

The purpose of the conference was the formulation of the elements of a nationwide health program which would unite the views of physicians, economists and administrators. The physicians in this conference do not represent the opinions of any considerable number of physicians in this country. Individually some of them apparently have a following of a few hundred doctors.

This report, which bears throughout innumerable indications of the authorship of Michael Davis, is replete with plausible aphorisms regarding medical care such as have marked such "literature" since Michael Davis became associated with the Rosenwald Fund. The Committee on Research in Medical Economics was established when he separated from the Rosenwald Fund. At that time a final grant of some \$135,000 was apparently made so he could carry on his activities under his own auspices; this sum has apparently been supplemented from time to time with small grants from other foundations. The report attacks plans of medical care which are limited to hospitalization, surgery or catastrophic illness only and also plans which provide cash payments. It calls for association of the health program with a broad system of social security.

The report asserts that a nationwide health program demands that (1) comprehensive medical services and facilities shall be physically and financially available to all the people, (2) these services shall be so organized and supplied as to be scientifically efficient and as economical in cost as is consistent with quality, (3) the services shall be adequately and securely financed and (4) professional opportunities shall be improved and adequate income assured the persons and institutions furnishing service. These are the objectives to which practically every intelligent person will subscribe. It is then stated that the health program should be a national system with decentralized administration of services and that it should cover the entire population, but that those who wish to purchase medical care outside the national health system should be free to do so. Compulsory sickness insurance is advocated with the statement "The chief support of a nationwide system of medical care should be contributory insurance required by law, with the amounts of

payment from employees, employers and self-employed persons related to the earnings of the contributors, combined with support from general taxation." General tax funds are to be secured in order to aid new or improved hospitals and health centers, particularly in rural areas, the further extension of full time public health departments and the provision or improvement of medical services to those dependent and other persons not directly covered by the insurance system, such as the chronically ill, the disabled and the aged. Free choice of physician is mentioned as a necessity, also the right of the physician to accept or reject patients and the right to participate or not to participate in the system. The voluntary hospitals, it is said, would remain as independent agencies which would make individual or group contracts for furnishing services under the national program and which would retain full responsibility for their own administration. Hospitals would retain responsibility for their administration, yet they could survive only by negotiating contracts with a governmental agency. The program proposes three methods of payment of physicians, including salary, capitation and (under certain conditions) fee for service, although it concludes that the use of the fee for service method should be discouraged.

The most important portion of this proposed program is the section devoted to the administrative organization. Here comes the statement that the national policy determining body for the national program should be representative of the chief groups of those who receive the service and of those who furnish it. The administrators of all professional and technical aspects of the program are to be qualified professional persons, the professional and the financial officials each having administrative authority in their respective fields. As might be anticipated, the proposals point again and again to the concept that the administrative control of medical services will be put in nonmedical hands.

Physicians who study this report are advised to consider particularly the next to the last paragraph. This reads:

There are numerous, important regulations which cannot be specified in a law. Some of these regulations may be national in application. Others will be designed for certain localities or will relate only to particular forms of service. These regulations must be worked out by the administrative authorities and when adopted have the force of law.

This paragraph represents the apotheosis of bureaucracy. Were the medical profession to agree to such a concept, it would be signing a blank check and turning it over to the nonmedical administrators for such disposition as they might care to make of the future of medicine.

Physicians who have followed the information made available through *THE JOURNAL* in recent months will

have noted the action taken in the International Labor Organization conference,¹ the action taken by the committee of the American Public Health Association² and now this report by Michael Davis's Committee on Research in Medical Economics. They should note that the same group has been active in all three places. They do not represent the medical profession of the United States. It is certainly questionable whether or not they represent any considerable number of people outside of themselves.

BACTERIOPHAGE ELECTRON MICROGRAPHS

Under the auspices of the Council on Pharmacy and Chemistry THE JOURNAL completes this week publication of a review of recent knowledge developed by use of the electron microscope. Already much of the practical value in the diagnosis and treatment of disease has been learned in this way.

Soon after the introduction of the electron microscope several European investigators¹ published micrographs showing the presence of minute "spermlike" particles in 'phage lysed bacterial cultures not present in 'phage free controls. More detailed studies of these presumptive "bacteriophagic sperms" have recently been reported by Luria² of the Guggenheim Foundation and Baylor³ of the University of Illinois. Luria photographed 3 coli bacteriophages. One of these had a uniformly opaque "head" 45 to 50 millimicrons in diameter to which was attached a "tail" about 150 millimicrons long and 10 to 15 millimicrons thick. The head of a second coli 'phage showed opaque and translucent areas, suggesting a nucleus. A third coli 'phage was apparently without a tail. One staphylococcus 'phage was about twice the size of the first coli 'phage in all dimensions, or eight times its volume. A second tailless 'phage acting against *Salmonella pullorum* is described by Baylor.

The particles thus made visible breed true in homologous bacterial cultures, they are never seen in 'phage free bacterial autolysates, and their number is always directly proportional to 'phage titer. The most suggestive part of these studies, however, are studies of the method of reaction between 'phage units and homologous bacterial cells. Usually within three minutes after bacteriophage has been added to a homologous bacterial culture practically all of the 'phage particles become adherent to the limiting membranes of the

bacterial cells. There is no evidence of a multiplication of the particles on the bacterial surfaces or of lytic action on the underlying parts of the bacterial cytoplasm. Luria's micrographs suggest that only one of the adherent 'phage particles is able to penetrate (or is drawn into) the bacterial cell. The other adherent particles are apparently excluded by a mechanism analogous to the exclusion of superfluous sperms by monospermatic ova. This suggests a closer genetic relationship between bacteria and homologous 'phage than previously assumed.

Following entrance of the single fertilizing 'phage unit there are local reductions in the opacity of the bacterial cytoplasm, accompanied by a capsular swelling, suggesting an increase in internal osmotic pressure. By the end of about twenty-five minutes the swelling and loss of opacity are usually complete. Rupture of the limiting membrane now takes place in one or more places. The excluded liquefied cell contents usually contain a hundred or more new 'phage particles, many of them attached to one another to form chains. The damaged or lacerated cell wall now remains as an almost invisible ghost.

This work has a suggestive bearing on current theories of virus antagonism. The suggestion that only one virus particle may enter an infected tissue cell, and that after entry it so alters the chemotactic balance as to exclude all other virus particles, is a plausible theory of epidemiologic interest. No adequate theory of the antagonism or mutual exclusion of different viruses had been previously suggested.

ARTERIOSCLEROSIS

The word arteriosclerosis is used for a variety of vascular diseases differing greatly in etiology and causative mechanism. The century old controversy with regard to the role of the various factors in the production of degenerative and sclerosing vascular lesions still continues.¹ The uncertainty and confusion interfere with the development of effective preventive and therapeutic measures. The problem has increasing medical, economic and social importance in view of the accelerated aging of the general population.²

Actually arteriosclerosis is not a normal sequel of aging and therefore as inescapable as gray hairs and wrinkles. In a current review of this subject Hueper³ has evaluated the available clinical, pathologic and experimental data. He divides the known exogenous

1. The International Labor Organization on Sickness Insurance, editorial, J. A. M. A. 126: 32 (Sept. 2) 1944.

2. American Public Health Association Health Insurance Declaration, editorial, J. A. M. A. 126: 434 (Oct. 14) 1944; Medical Care in a National Health Program, Organization Section, *ibid.* 126: 441 (Oct. 14) 1944.

1. Ruska, H.: *Naturwissenschaften* 28: 45, 1940; 29: 367, 1941.

2. Luria, S. E., and Kausche, G. A., *ibid.* 28: 46, 1940.

3. Baylor, M. R. B.: *Severens, J. M., and Clark, G. L.: J. Bact.* 47: 277, 1944.

1. Leary, Timothy: *Cholesterol Lysis in Atheroma*, Arch. Path. 37: 16 (Jan.) 1944. Hirsch, E. F., and Weinhouse, Sidney: *Role of Lipids in Atherosclerosis*, Physiol. Rev. 23: 185 (July) 1943. Moschowitz, Eli: *Vascular Sclerosis*, New York, Oxford Press, 1942. Winternitz, M. C.: *Views as to Causes of Coronary Sclerosis in Blood, Heart and Circulation*, Washington, D. C., American Association for the Advancement of Science 13: 114, 1940. Duff, G. L.: *Experimental Arteriosclerosis and Its Relationship to Human Arteriosclerosis*, Arch. Path. 20: 81 (July), 1939 (Aug.) 1935.

2. Cowdry, E. V.: *The Physician's Opportunity to Help Older People*, J. A. M. A. 125: 402 (June 10) 1944.

3. Hueper, W. C.: *Arteriosclerosis*, Arch. Path. 38: 162 (Sept.) 1944.

and endogenous causes of arteriosclerosis into four main groups according to their special causative mechanism: (1) hypotonic and hypertonic vascular agents, (2) hypotensive and hypertensive intravascular hydrostatic factors, (3) colloidal plasmatic disturbances and (4) hematic anoxemic agents. The fundamental mechanism common to all these agents, according to Hueper, is an impairment of the oxygenation and the nutrition of the vascular wall. However, only colloid plasmatic disturbances of lipid or carbohydrate nature produce foam cell atheroma and atherosclerosis, while the other agents elicit edematous, fibrosing and hyaline intimal thickening. Medial degeneration and calcification are seen with all agents, and their occurrence depends in part on the intensity of the arteriosclerogenic action of a particular agent, in part on complicating factors.

Applying these concepts to prevention and therapy of arteriosclerosis, Hueper notes that proper consideration must be given in the choice of such procedures to their suitability in the individual case in view of the existing differences in the character of the causal agent, the type of causative mechanism and the anatomic character of the vascular reaction. Thus atheromatosis and atherosclerosis require preventive and therapeutic measures different from those indicated in combating the causal factors and anatomic lesions connected with vaso-tonic mechanisms. Similar considerations apply also to the selection of diagnostic procedures. The concepts advanced are provocative in many respects and should stimulate physicians as well as nutritionists and chemists to adopt a more comprehensive approach to the problem of arteriosclerosis.

Current Comment

THERAPY OF ADVANCED SHOCK

Many investigators hold that there is strong contraction of the arterioles and arteries in hemorrhagic and traumatic shock and that the use of vasoconstricting agents is contraindicated and harmful because it results in further decrease of blood to important organs. Recent observations raise serious doubts of the correctness of this assumption and its therapeutic implication. Chambers and his co-workers¹ noted that a vasopressor agent is present in the blood only in the primary phase of shock, while in the late and therapeutically most important stage a vasodepressor substance predominates. In experiments on dogs with sectioned aortic depressor and carotic sinus proceptor nerves Schafer² found that the hypertension did not elicit any shock syndrome. These results as well as observations in surgical practice do not lend support to the theory of a sympathico-adrenal hyperactivity in shock. The application of heat in shock may aggravate the condition apparently by

relaxing the peripheral vessels and thereby favoring hypotension. Cold, on the other hand, reduces the onset or severity of shock by peripheral constriction and reduction of the total vascular bed, making more blood available to internal organs. The validity of this reasoning is supported from the results obtained by Hueper and Ichniowski³ in dogs with severe and advanced histamine shock following a slow intravenous injection of a solution of hydrophilic colloid (methyl cellulose) and a cardiovasopressor agent (s-methylisothiourea). Similar good effects on terminal hemorrhagic shock in dogs were recently recorded by Kohlstaedt and Page⁴ by the consecutive administration of tuamine (2-amino heptane sulfate), a pressor amine, and blood. These results suggest that the combination of increased intravascular hydrostatic pressure and stimulation of the contractile cardiovascular tissue, which is anoxemically injured and therefore abnormally relaxed, may represent a rational therapeutic procedure in the management of advanced traumatic or hemorrhagic shock.

RECRUITMENT OF CIVILIAN PHYSICIANS FOR ARMY DISCONTINUED

Elsewhere in this issue appears the announcement by the War Department and by the War Manpower Commission that recruitment of civilian physicians for the Army has been discontinued. The Navy requires 3,000 additional officers at once. The Army is to fill its future requirements from the young men who complete their medical education and internships. There are now 47,500 physicians on duty in the Army, including those serving with the Veterans Administration, and some 13,000 in the Navy. Three hundred additional physicians are needed for the Coast Guard. During the war emergency physicians from the Army Medical Department and the U. S. Naval Reserve will be assigned to the Veterans Administration to meet the needs of care of the veterans. In the meantime it will become necessary for the Veterans Administration to recruit additional physicians in large numbers to meet the needs of that agency when it is no longer possible to supply physicians through the armed forces.

RABIES IN NEW YORK CITY

Because of the spread of canine rabies from the borough of the Bronx to the rest of New York City the board of health has recently extended the antirabies quarantine on dogs to the entire city. One New York woman who was bitten by her pet has already died from this disease. The police department has been directed to issue court summonses to owners of dogs who allow their animals to run at large without a leash. A rigid system of quarantine is now necessary, it has been announced. Rabies in dogs and some wild animals is now so widespread that concerted nationwide efforts at its elimination through quarantine are needed.

1. Chambers, R.; Zweifach, B. W.; Lowenstein, R. E., and Lee, R. E.: Vaso Excitor and Depressor Substances as "Toxic" Factors in Experimentally Induced Shock, *Proc. Soc. Exper. Biol. & Med.* 56: 127, 1944.
2. Schafer, P. W.: Hyperactivity of Vasoconstrictor Nerves in Relation to Shock, *Surg., Gynec. & Obst.* 79: 163, 1944.

3. Hueper, W. C., and Ichniowski, C. T.: The Treatment of Standardized and Graded Histamine Shock in Dogs with Solutions of Methyl Cellulose and s-Methylisothiourea, *J. Pharmacol. & Exper. Therap.* 78: 282, 1943.

4. Kohlstaedt, K. G., and Page, I. H.: Terminal Hemorrhagic Shock, *Surgery* 16: 430, 1944.

MEDICINE AND THE WAR

ARMY

NEW ARMY STATEMENT ON REQUIREMENT AND USE OF PHYSICIANS

The requirements of the Surgeon General to maintain the established strength of Medical Corps officers on active duty will be met through the appointment of medical ASTP trainees and medical students holding inactive commissions in the Medical Administrative Corps and by calling to active duty Medical Corps officers who are on inactive status for further training as interns, junior residents or senior residents at nonmilitary hospitals. Accordingly, appointments in the Medical Corps, Army of the United States, will not be made direct from civil life except for assignment to active duty with the Veterans Administration.

All appointments resulting from applications processed in accordance with this directive will be in the Medical Corps, A. U. S., for assignment to duty with the Veterans Administration only. Every effort must be made to persuade candidates whose applications are processed under these instructions to accept this appointment.

Recalcitrant physicians, including interns and residents, will not be reported to Selective Service.

Qualified candidates who of their own volition may apply for commission in the Medical Corps and who cannot be processed under these instructions will be advised that a great need exists within the Navy and Public Health Service and will be urged to contact the appropriate offices for information regarding these services.

NEUROPSYCHIATRY FOR GENERAL MEDICAL OFFICER

According to the Technical Bulletin of Medicine No. 94, issued by the War Department recently, every medical officer, regardless of his mission, whether battalion surgeon, ward officer, flight surgeon or dispensary physician, is confronted with psychiatric problems. There is an inadequate number of psychiatrists, and, furthermore, not only must the average medical officer do most of the minor psychiatry in the Army, but in some instances he may also be forced by circumstances to do major psychiatry. Psychiatric treatment, like surgical treatment, is most effective when carried out early, promptly and skilfully. Consequently, some of the best psychiatry will be done outside the hospital in such places as the dispensary, the consultation service, the battalion aid station, the clearing station and the air strip. Because most medical officers have inadequate training in this field, the suggestions in this bulletin are presented as a general guide.

SHORTAGE OF NURSES IN THE ARMY

Major Gen. Norman T. Kirk, Surgeon General of the Army, announced recently that there is a critical shortage of nurses in the Army and that there has been a disappointing response to the call for 10,000 additional nurses. Only 500 applied out of the 4,000 expected during September. Army nurses now number about 40,000, the number in the United States having been reduced to about 13,000. About 4,000 of these are assigned to the Air Forces.

TRENCH FOOT

The War Department recently issued a change in regulations governing treatment for trench foot from that given in the Technical Bulletin of Medicine No. 81, issued August 4, as follows:

Treatment. b. Definitive treatment. (1) Patients should be kept in bed, with the affected parts on a horizontal level with or elevated on pillows only slightly above heart level, and protected from external pressure either by complete

exposure or by means of a cradle. Elevation of the extremities should be done only if there is no evidence of inadequate circulation, that is, incipient gangrene; otherwise they should be maintained on a horizontal level. The period of bed rest is determined by degree and rate of subsidence of edema for this form of treatment.

ARMY AWARDS AND COMMENDATIONS

Captain Hershell B. Murray

Capt. Hershell B. Murray, formerly of West Liberty, Ky., recently received a letter of commendation from Brig. Gen. Emer Yeager for his exemplary work performed by his field hospital unit in the South Pacific war zone. The letter of commendation read, in part, "Please express to the officers, nurses and enlisted men of the 5th Field Hospital my regards and appreciation of the manner in which this unit functioned since entering this base. During the period July 13 to August 3, 1944, under adverse conditions, the hospital was constructed and operated. A great many more patients than normal for such a unit received the best possible care. It is the opinion of the surgeon of the headquarters that the entire operation was the finest done by any hospital seen in this theater. Such performance reflects the highest type training, morale and discipline." Dr. Murray graduated from the University of Louisville School of Medicine in 1932 and entered the service Sept. 13, 1942.

Major Samuel M. Klein

Major Samuel M. Klein, formerly of Jackson Heights, N. Y., was recently cited by Lieut. Gen. Mark W. Clark for "conspicuous coolness" under fire in Italy. The citation states that at Anzio last January the doctor ignored "bombing, shell fire and falling flak by continuing to perform his duties of [treating] the wounded. His selfless devotion to duty aided in saving lives. His performance reflects the high tradition of the Medical Corps." Dr. Klein served in Africa and with the first invasion of Sicily, Salerno and Anzio and now is stationed at a base hospital near Rome. Dr. Klein graduated from New York University College of Medicine, New York, in 1920. Before joining the army in August 1942 Dr. Klein was president of the Long Island City Medical Society.

Captain Bertram E. Sprofskin

The Soldier's Medal was recently awarded to Capt. Bertram E. Sprofskin, formerly of Nashville, Tenn., for heroism in making several spectacular rescues in the Southwest Pacific. The citation stated that he entered the "high and choppy seas" to bring the first soldier in from about 150 yards. Then "despite exhaustion from the first rescue," he swam to the aid of another struggling soldier, who was about 100 yards at sea and 150 yards east of him. "The action of Captain Sprofskin on this occasion undoubtedly saved the lives of both men and reflects great credit on himself and the military service." Dr. Sprofskin graduated from Vanderbilt University School of Medicine, Nashville, in 1942 and entered the service July 30, 1943.

Major Solomon Rosokoff

The Bronze Star was recently awarded to Major Solomon Rosokoff, formerly of Tonawanda, N. Y., and now an executive officer of an armored medical battalion in France. The citation read in part "He has actively coordinated much of the evacuation of the wounded in his division by liaison. In order to maintain contact with these units, Major Rosokoff subjected himself to enemy artillery, small arms fire and aerial bombardment without regard to personal safety. . . . Treatment of the wounded was reduced to a minimum, thereby saving lives." Dr. Rosokoff graduated from the University of Buffalo School of Medicine in 1935 and has been in the service for four years.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

ARMY MEDICAL DEPARTMENT DISCONTINUES RECRUITMENT OF CIVILIAN PHYSICIANS

Paul V McNutt, chairman of the War Manpower Commission announces that he has been informed by the War Department that recruitment of civilian physicians for the Army has been discontinued. At the same time he announces that recruitment for the Navy must continue, since it has urgent need for approximately 3,000 additional medical officers. The U S Public Health Service and the Veterans Administration are also continuing to recruit physicians, Mr McNutt said.

Vice Admiral Ross T McIntire chief of the Bureau of Medicine and Surgery, U S Navy, informed Mr McNutt that personnel expansion and intensification of operations in the Pacific have precipitated a grave shortage of medical officers.

"With less than 13,000 medical officers on active duty in the Navy the procurement of at least 3,000 more as soon as possible is imperative," said Admiral McIntire. "Even this figure will not meet actual needs but would ease the emergency that now exists, physicians and surgeons whose availability has been or may hereafter be certified by the Procurement and Assignment Service WMC, should lose no time in obtaining particulars for commissions in the Navy Medical Corps by communicating with their nearest office of Naval Officer Procurement."

Mr McNutt said he had been informed that the Army will fill its future requirements for military physicians from sources now available to the Army and thereafter will not require certification of availability of additional physicians from the Procurement and Assignment Service of the War Manpower Commission. There are now about 47,500 physicians on duty as medical corps officers of the Army. This probably includes those serving with the Veterans Administration and other governmental agencies to which the Army Medical Corps assigns its medical corps officers.

Mr McNutt said that there are at present roughly 60,000 physicians in the armed forces and the Veterans Administra-

tion. The total number of physicians in the armed forces represents approximately 40 per cent of the active medical profession of the United States.

In addition to the 3,000 medical officers needed at present by the Navy, the Public Health Service has need for approximately 300 for the U S Coast Guard and other agencies.

In informing Mr McNutt of the termination of the Army recruiting of physicians except for the occasional specialist Major Gen Norman T Kirk Surgeon General of the Army, said "The large number of physicians now in the Army volunteered for commissions without regard for their personal interests. The U S Army Medical Department is appreciative of the fine service they have given. Their removal from their usual practice also represents a sacrifice on the part of all civilians, who have had to get along with less medical care than they obtained in peacetime."

The Veterans Administration has, and will continue throughout the duration of the war emergency to have, assigned to it medical officers in the Army and the U S Naval Reserve to care for the needs of the casualties in its charge, the War Manpower Commission said. Doctors whose applications are at present in process for appointment in the Army Medical Corps will be considered for appointment and assignment to duty with the Veterans Administration, the War Manpower Commission statement added.

Mr McNutt said that the War Manpower Commission joins with the directing board of its Procurement and Assignment Service and the War Department and the Office of the Surgeon General in expressing appreciation of the sacrifice involved in cooperation that was necessary on the part of physicians and the public before the Army reached its present level of medical personnel.

Mr McNutt also expressed the hope that additional civilian physicians will respond to the Navy's appeal for more doctors to apply for commissions. The needs of the U S Public Health Service and the Veterans Administration he said although much smaller than those of the Navy are nevertheless important.

MISCELLANEOUS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service.

(Continuation of list in THE JOURNAL October 21 page 504)

CALIFORNIA

St Joseph Hospital San Francisco Capacity 289 admissions 7,218
Sister M Raymond, Superior (intern)

CONNECTICUT

Hospital of St Raphael, New Haven Capacity, 400 admissions,
7,986 Sister Rose Alexis Director (interns)
Waterbury Hospital, Waterbury Capacity 372 admissions 8,144
Miss Andr E Creer, RN Superintendent (5 interns, 1 resident,
July 1 1945)

IOWA

Iowa Methodist Hospital Des Moines Capacity, 270 admissions
8,003 Mr R A Nettleton, Administrator (intern, July 1 1945)

LOUISIANA

North Louisiana Sanitarium, Shreveport Capacity 121 admissions
556 Mr Herman I Herold Administrator (intern)

NEW HAMPSHIRE

Sacred Heart Hospital Manchester Capacity 163 admissions 2,561
Sister Mary Bernardus, RN, Superintendent (mixed residents)

NEW JERSEY

St Joseph Hospital Paterson Capacity 460 admissions 7,234 Sister
Anna Rita RN Superintendent (4 interns 1945)

NEW YORK

Our Lady of Victory Hospital, Ithaca Capacity 183 admissions
4,143 Sister M Batholae Superintendent (2 interns Jan 1, 1945)

OHIO

Springfield City Hospital Springfield Capacity 309 admissions 6,917
Mr F E Kasser, Executive Director (2 interns)

TENNESSEE

Knoxville General Hospital, Knoxville Capacity, 325 admissions,
7,714 Mr T H Haynes Superintendent (3 interns April 1, 1945)

WASHINGTON

Providence Hospital Seattle Capacity, 434 admissions 15,858 Sis
ter M Bernadine RN Superintendent (2 interns 2 residents)

WEST VIRGINIA

Charleston General Hospital, Charleston Capacity 380 admissions
10,200 Dr John E Cannaday, Director (junior resident—surgical)

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced.

Deshon General Hospital Butler Pa The Deep and Superficial Mycoses Major H H Sawicki, November 9, Psychoneurosis Capt Peter H Knapp, November 16

U S Naval Hospital Great Lakes Ill The Management of Acute Respiratory Obstructions Dr Paul H Holinger, November 8 Rest, Dr Don C Sutton, November 21

Camp McCoy, Wis Malignancies in the Army Age Group Dr Gorton Ritchie, November 15, Endocrinology, Dr Elmer L Sevringhaus, November 29 Gallbladder and Liver Disease Dr Erwin R Schmidt November 29

Tuberculosis League.—The thirty-eighth annual meeting of the New Jersey Tuberculosis League was held at the Hotel Stacy-Trent, Trenton, October 17. Among the speakers participating in a panel discussion on "Problems of Developing a Program for the Discovery and Prevention of Tuberculosis in Industry" were Dr. Leopold Brahdy, New York, Louis Horowitz, area director, War Relief Committee, Congress of Industrial Organizations, Dr. A. Joseph Hughes, Camden, and Dr. John F. Johnson, Trenton. In a session devoted to "Forty Years of Progress in Stamping Out Tuberculosis" the speakers included Dr. Charles J. Hatfield, Philadelphia; Louis I. Dublin, Ph.D., New York; Dr. Frederick H. C. Heise, Trudeau, N. Y., and Clyde R. Miller, Ph.D., New York.

NEW YORK

Graduate Lecture.—Dr. John G. Fred Hiss, professor of clinical medicine, Syracuse University College of Medicine, Syracuse, will address the Erie County Medical Society in Buffalo, November 28, on "Common Errors in the Diagnosis of Heart Disease, with Special Reference to Rheumatic Heart Disease."

Personal.—At the recent graduation exercises of the New York Medical College, Flower and Fifth Avenue Hospitals a "gold diploma" signifying fifty years of service in the practice of medicine was presented to Dr. William L. Love, Patchogue. —Dr. Elias W. Young has been appointed substitute village health officer of Goshen, succeeding the late Dr. Ralph L. McGeoch, who held the position during the absence of Dr. Nathaniel T. Keys.

New York City

Bailey B. Burritt Retires.—Bailey B. Burritt, A.M., retired on November 1 as chairman of the executive council of the Community Service Society of New York under the group's retirement plan. He has served the society for thirty-one years. A newly created position of general director will be filled by Stanley P. Davies, Ph.D., executive director of the society since its formation by merger in 1939.

Artists Cooperate in Health Posters.—A special exhibit is on display at the Wilderstein Galleries showing the conception of famous artists on health education. The pictures and their captions were developed under the leadership of Madame Elsa Schiaparelli as chairman of a special committee on health posters with the assistance of the American Museum of Health. The posters are intended primarily for use in public health programs to be carried on in Europe after the war and in the meantime are available for reproduction and use in this country. One of the features of the exhibition is a poster on syphilis by Salvadore Dali; there are also health education studies by Vertes, Helion, Donati and Farbes.

Diabetes Clinical Society Organized.—The Clinical Society of the New York Diabetes Association has been organized with the following officers: Drs. John J. Weber, Brooklyn, chairman; Louis Bauman, New York, first vice chairman; Edmund L. Shlevin, Brooklyn, second vice chairman, and Harry G. Jacobi, New York, secretary-treasurer. The society is functioning under the auspices of the parent organization and is somewhat of an outgrowth of the clinics committee, which has now been dissolved. The society will consist of fellows, associate fellows and members. A carefully selected founding group of specialists in diabetes will constitute the nucleus of the fellowship; this group will formulate standards for subsequent admission to fellowship and associate fellowship and will be the sole body which votes in future fellows. The board of directors of the New York Diabetes Association wishes to establish a representative founding group from among the specialists in the five boroughs and has appointed a nominating committee to examine credentials and to make recommendations. The new society will take over the establishing of standards for diabetes clinics in New York City and the vicinity. It will aim to bring about general adoption of these standards and for this purpose will recommend to the parent organization certification of individual hospital clinics adequately meeting its prescribed standards, as well as withdrawal of certification on delinquency. It will initiate, conduct and publish statistical surveys on the basis of data derived from certified clinics. It will promote constructive relationships between physicians who are specialists in diabetes and representative physicians of allied medical specialties, such as ophthalmologists and surgeons, who will selectively be admitted to the fellowship. It will have contact with related technical groups such as dietitians, laboratory technicians, nurses and social workers through the "member" category. It will by close mutual association promote scientific understanding and

conquest of problems in the management of diabetes, especially as these are encountered in clinical practice. The inaugural meeting of the society was held at the University Club, October 26.

Mayor's Health Plan Launched.—The Health Insurance Plan of Greater New York, proposed by Mayor Fiorello La Guardia this year, was informally organized at a meeting on October 19. Temporary officers were chosen and the honorary title of Founder conferred on the mayor. Among the temporary officers are Dr. Willard C. Rappleye, chairman, dean of the Columbia University College of Physicians and Surgeons, and Mr. Winslow Carlton, secretary; Dr. John J. Wittmer and Matthew Woll, labor leader, are among the vice presidents. About \$200,000 is now available for underwriting the program, of which \$150,000 is pledged by the New York Foundation and \$25,000 by the Albert and Mary Lasker Foundation. The plan aims to provide comprehensive medical and surgical services at moderate cost to all persons living or working in New York and earning up to \$5,000 a year (*THE JOURNAL*, May 13, p. 161). The *New York Times* in reporting the meeting stated that one of the main tasks of the directors would be to obtain the cooperation of the five local county medical societies. These groups, while endorsing the plan in principle, are opposed to the \$5,000 income ceiling for eligibles, preferring a ceiling of \$2,500 or, at most, \$3,000. It will be up to the directors, it was said, to convince the organized medical groups that a \$5,000 ceiling is needed to obtain group enrolments that will include section heads, foremen and other employees in supervisory positions. Another important job set for the directors by the mayor is to convince the medical societies that "teamwork medicine" should be part of the program. The mayor cited the advantages of group medicine as practiced in other cities. Coverage would also extend to members of their families under 18 years of age. The plan cannot begin to function, it was said, until the state insurance department has approved the financial setup.

Another Diploma Mill.—George William Manus, 24 years old, was taken into custody October 13 charged with operating a diploma mill in a two room suite at 103 Park Avenue which specialized in doctorates, the *New York Herald Tribune* reported. He was arraigned before Judge Frederick L. Hakenburg in special sessions for alleged violations of the state education and penal laws and was held in \$5,000 bail for a hearing that was to be held October 16. An investigation by the court disclosed that Manus had issued some 4,000 "degrees" for fees running from \$450 to \$800. From letter-heads and documents found in the office, police were reported to have said that Manus represented himself as a physician with an M.D. degree from White Cross Medical College of the University of Physicians and Surgeons of Southern California. He also called himself executive vice dean and treasurer of the New York College of Psychiatry. Both institutions were allegedly mythical. "His pet institutions" for which he issued his diplomas were called "Extension Branch of Los Angeles University, College of Psychiatry," and the "Golden State University of Los Angeles." The former is said to be nonexistent and the latter is the outgrowth of the Eldridge Drugless Colleges incorporated in California in 1922. A report on the school published in the *Federation Bulletin* in May 1940, page 151, stated that all schools in the United States should be aware of the fact that degrees given by the schools are of "diploma mill" worth. The newspaper reported that the courses of study offered by Manus included hypnotic, painless and drugless childbirth, prenatal suggestion, instantaneous hypnosis, reflex therapy (described as a method for growing hair on bald heads), practical and applied psychology, suggestion and autosuggestion, psychological somnotherapy, suggestive therapeutics, color therapy, vibro therapy, chemical psychology and chemical psychotherapy, advanced esoterics and metaphysics. His specialty was the solicitation of chiropractors as postgraduate students in "psychological healing" in all its branches, leading to such degrees as doctorate of philosophy in psychology for a fee of \$500, doctorate of science for a fee of \$800, formerly \$1,000, and doctorate of psychotherapy for a fee of \$450. The New York County Grand Jury handed down an information against Manus on October 10 charging him with violations of section 66 of the state education law in that his "college" functioned without having been chartered by the state board of regents; conducting business under an assumed name without having filed a certificate with the county clerk; using the title "Doctor" in connection with public health matters without legal authorization in violation of the educational law, and issuance of descriptive material implying that his institution was a school of medicine, without sanction of the board of regents.

NORTH CAROLINA

New Professor of Pharmacology.—Dr. Arnold J. Lehman, associate professor of pharmacology, Wayne University College of Medicine, Detroit, has been appointed professor of pharmacology at the University of North Carolina School of Medicine, Chapel Hill. Dr. Lehman graduated at Stanford University School of Medicine, San Francisco, in 1936.

Changes in Health Personnel.—Dr. Greene L. Rea, who has been associated with the public health department in Charlotte for twenty-three years, was not to be assistant health officer after October 1, with the abolition of this position in the department. The decision to discontinue the position was reached during a recent reorganization of the health department under the direction of Dr. William R. Cameron.—Dr. Oscar David Garvin, health officer of Richmond and Scotland counties, has been appointed to a similar position in Chatham, Orange and Person counties to succeed Dr. William P. Richardson, Chapel Hill, who resigned to become a district director in the division of local administration of the state board of health, it is reported.

OHIO

Personal.—Dr. William E. Mishler, Cleveland, has been appointed chief surgeon of the Erie Railroad to succeed Dr. James Frank Dinnen, who is retiring because of ill health. Dr. Dinnen has been associated with the Erie Company since 1927; he had been assistant chief surgeon of the Nickel Plate Road for nineteen years assisting his father, who had been chief surgeon there since 1881, the *Cleveland Plain Dealer* reported.

Torald Sollmann Honored.—On September 25 Dr. Torald H. Sollmann, dean emeritus and professor emeritus of pharmacology and materia medica, Western Reserve University School of Medicine, was guest of honor at a dinner and presented with a silver plaque in recognition of his distinguished services. Winfred G. Leutner, LL.D., president of Western Reserve University, was toastmaster of the affair, which was sponsored by the faculty and alumni of the medical school. Dr. Sollmann, who had been associated with the school for nearly fifty years, is chairman of the Council on Pharmacy and Chemistry of the American Medical Association.

Broadcast in Health.—The Cleveland Health Museum, in cooperation with the Academy of Medicine of Cleveland and the Cleveland Dental Society, has resumed its radio programs over station WGAR. The series, which opened October 3 with a talk by J. V. Gentilly, D.D.S., and Dr. Gerald B. Hurd, on "A Tooth for Every Baby?" includes:

- Dr. Robert F. Parker, Penicillin, October 10.
- Ralph E. Creig, D.D.S., Your Child's Teeth, October 17.
- Dr. Horace E. Mitchell, Lakewood, Foreign Bodies in Food and Air Passages, October 24.
- C. C. Buckis, D.D.S., and Thomas F. Healy, D.D.S., Those Six Year Molars, October 31.
- Dr. Middleton H. Lambricht, Warning Signs of Cancer, November 7.
- Dr. Howard Lester Taylor, The Health Museum, November 14.
- Dr. Charles E. Kinney, To Protect Your Child's Hearing, November 21.
- Leon E. Newman, D.D.S., and William C. Stillson, D.D.S., Teeth of the Teen Age, November 28.

Medical Library Observes Fiftieth Anniversary.—The Cleveland Medical Library Association will celebrate its fiftieth anniversary, November 26-27. On the first day the library will be open for public inspection and Dr. Normand L. Hoerr, professor of anatomy, Western Reserve University School of Medicine, Cleveland, will deliver an address entitled "The Forgotten Man in Medical Education." A jubilee banquet will be held the second evening at which members of the library association will be hosts to invited civic leaders, educators, librarians and honorary consultants to the Army Medical Library. As a feature of the anniversary the association is planning the publication of a catalogue of the famous Nicolaus Pol Library, of which the Cleveland Medical Library possesses the largest nucleus. The project is under the direct supervision of Dr. Max E. Fisch, curator of incunabula in the Army Medical Library.

OREGON

Medical Students Recommended for Membership.—At the recent annual meeting of the house of delegates of the Oregon State Medical Society it was voted to recommend to the council that a membership for medical students be created. The president of the society was also authorized to apprise Governor Earl Snell that the establishment of a university hospital at the University of Oregon Medical School, Portland, for patients on the indigent level was favorably considered. A

questionnaire seeking the profession's reaction to the proposal, which was issued by the dean of the medical school, states that the project was being planned to improve facilities for teaching medical students and "to provide a diagnostic service for doctors of the state for patients on the indigent level."

Physicians in the Legislature.—*Northwest Medicine* reports the following physicians as candidates in the Oregon legislature:

Dr. Ferdinand H. Dammasch of Multnomah County, a past president of the Multnomah County Medical Society, who was a member of the joint ways and means committee and chairman of the house committee on medicine, pharmacy and dentistry at the 1943 session, is again a candidate in the November election. Dr. Dammasch also served in the 1933 session.

Dr. William T. Johnson of Benton County, former president of the Oregon State Medical Society, is also a candidate for the house.

Dr. James A. Best of Umatilla County, holdover senator, is one of the veteran members of the senate, having served in the 1935, 1937, 1939, 1941 and 1943 sessions. He also served as representative in the 1933 session.

Dr. Joel C. Booth of Linn County, a past president of Central Willamette Medical Society, is also a holdover senator. Dr. Booth is a senior senator with service in the 1931, 1933, 1939, 1941 and 1943 sessions.

Dr. William A. Moser of Josephine County is a new candidate for the senate.

PENNSYLVANIA

Special Society Election.—Dr. Michael J. Penta was installed as president of the Reading Eye, Ear, Nose and Throat Society at its recent meeting in Reading. Other officers include Drs. Roland M. Brickbauer, first vice president, Isaac B. High, second vice president and president-elect, Harold L. Strause, treasurer, and Paul C. Craig, secretary.

Philadelphia

Annual Dinner of Resident Physicians.—The fifty-eighth annual dinner of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital will be held on December 5 at the Bellevue-Stratford Hotel, with Dr. George Wilson presiding as toastmaster. Ex-residents who do not receive notices of the dinner are requested to send their correct addresses to the secretary, Dr. Robert C. McElroy, 133 South 36th Street, Philadelphia 4.

TEXAS

Auxiliary Library Endowment Fund.—The Woman's Auxiliary library endowment fund was established September 18, when a check for \$1,000 was received in the office of the State Medical Association of Texas from the treasurer of the auxiliary. The donors of this, the first endowment fund of the auxiliary, are Mr. and Mrs. G. A. Ray, Pettus, who established this fund in memory of their daughter, Romaine Ray, who died Sept. 12, 1941. The fund is to be known as "The Romaine Ray Memorial Fund."

Personal.—J. Allen Scott, Sc.D., associate professor of epidemiology and medical statistics at the University of Texas School of Medicine, Galveston, is participating in the organization and work of a parasitology survey in the Amazon area at Belem, Brazil, under the auspices of the Rockefeller Foundation and the Office of the Coordinator of Inter-American Affairs. He will return to his duties at Galveston in November.—Dr. Julius C. Davis, Rule, has been appointed a member of the state board of health to succeed Dr. Samuel E. Thompson, Kerrville, resigned.

State Surgeons Choose Officers.—Dr. Samuel D. Weaver, Dallas, was elected president of the Texas Surgical Society during its meeting in Galveston, October 2-3. Other officers include Drs. Jared E. Clarke, Houston, and George R. Enloe, Fort Worth, vice presidents; Walter G. Stuck, San Antonio, secretary, and Elbert Dunlap, Dallas, treasurer. Among the speakers at the meeting included:

- Dr. John W. Duckett, Dallas, Surgical Treatment of Tumors of the Liver.
- Dr. Enloe, Adenoma of Pancreatitis with Hyperinsulinism.
- Dr. Johnson Peyton Barnes, Houston, A Simple, Safe, Efficient Method of End to End or End to Side Intestinal Anastomosis.
- Dr. George V. Brindley, Temple, Presacral Tumors.
- Dr. George W. N. Eggers, Galveston, Chronic Dislocation of the Metacarpal of the Thumb.
- Dr. Frank C. Beall, Fort Worth, Deficient Fixation of the Right Colon.
- Dr. Marcós Fernan-Nunez, Milwaukee, Tropical Surgery.
- Capt. Stirling E. Russ and Capt. John S. Gaynor, M. C., Spontaneous Rupture of the Spleen.

The second day's program was devoted to clinical sessions. Features of the meeting included a talk by Stewart H. Evans, Galveston, British vice consul (honorary), entitled "A Clipper Trip to England" and an exhibit of drawings, sketches and etchings by Charles M. Pomerat, Ph.D., professor of anatomy, University of Texas Medical Branch, Galveston.

"Magnetic Ray Belt Maker" Fined.—Dr. Frank B. Moran, Dallas, who graduated at the University of Michigan Department of Medicine and Surgery, Ann Arbor, in 1894, was sentenced to ten days in jail and fined \$750 recently when a ruling was handed down that the physician had violated an injunction issued by the court in 1942 against transporting in interstate commerce his "magnetic ray belt," the *Texas State Journal of Medicine* reported. The belt is said to be made and sold by the Magnetic Ray Company, reputedly owned by Dr. Moran. The injunction was granted on petition of the government on the ground that the belt was mislabeled, it was stated.

VIRGINIA

Personal.—Dr. William A. Browne, city health officer of Alexandria, has been appointed epidemiologist of Richmond effective October 1. Dr. Browne held the Richmond position from 1935 to 1940. He once held a similar position in the New York City health department. He carried on a survey of scarlet fever in Richmond under the auspices of the Rockefeller Foundation, it is reported.

Faculty Changes at College of Virginia.—A department of physical medicine has been created under a recent grant by the Baruch Committee on Physical Medicine to the Medical College of Virginia, Richmond. Dr. Frances A. Hellebrandt, associate professor of physiology, University of Wisconsin Medical School, Madison, has been named professor of physical medicine, effective October 1, and Dr. Ernst Fischer, associate professor of physiology at the college, has been transferred from the department of physiology to the department of physical medicine with the rank of professor of physical medicine. Robert W. Ramsey, Ph.D., of the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., has been named associate professor of physiology.

WASHINGTON

Industrial Hygiene Division Named Information Center in New Program.—The industrial hygiene division of the Washington State Department of Health was selected as an information center in a new cooperative industrial program in the state. The program was launched at a recent meeting in Seattle sponsored by the Seattle Safety Council and attended by representatives from labor, industry, government agencies and the medical profession. To avoid overlapping in a concentrated industrial health program, committees were appointed and industrial health problems were broken down into eight brackets: nutrition, safety, sanitation, occupational diseases, venereal disease, tuberculosis and other communicable diseases and plant medical facilities, including medical, dental, nursing and first aid activities. The industrial hygiene division of the state health department will function as an information bureau by referring each problem that comes to it from industry, labor or others to the appropriate committee, which in turn will decide where the responsibility lies under the coordinated program. According to *Northwest Medicine* it is believed that this service through the information bureau and the permanent committees will reduce confusion due to duplicated effort, overlapping activity and conflicting recommendations. Agencies cooperating in the program include the Committee on Congested Production Areas, King County Health Department, National Committee for the Conservation of Manpower in War Industries, Seattle City Health Department, Seattle Safety Council, Smaller War Plants Corporation, state health department, State Department of Labor and Industries, State Nutrition Committee, U. S. Army, U. S. Bureau of Mines, U. S. Department of Labor, U. S. Maritime Commission, U. S. Navy, U. S. Public Health Service, War Food Administration, War Manpower Commission, War Production Board labor production division, War Production Board production drive, Washington State Social Hygiene Association and the Washington Tuberculosis Association.

GENERAL

Urology Award.—The American Urological Association offers an annual award "not to exceed \$500" for an essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented, and, if the committee on scientific research deems none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years.

All interested should write the secretary for full particulars. The selected essay (or essays) will appear on the program of the June 1945 meeting of the American Urological Association. Additional information may be obtained from the secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis, Tenn., who must receive competitive essays on or before March 15.

Association of American Medical Colleges.—Dr. John Walker Moore, Louisville, was chosen president-elect of the Association of American Medical Colleges during its annual meeting in Detroit, October 23-25, and Dr. Albert C. Furstenberg, Ann Arbor, Mich., was installed as president. Dr. William S. McEllroy, Pittsburgh, was elected vice president and Drs. Fred C. Zapffe and Arthur C. Bachmeyer, both of Chicago, were reelected secretary and treasurer respectively. Drs. Walter A. Bloodorn, Washington, D. C., and Wilburt C. Davison, Durham, N. C., were chosen members of the executive council of the association, succeeding Drs. Willard C. Rappleye, New York, and Russell H. Oppenheimer, Atlanta, Ga., whose terms expired. The 1945 session will be in New Orleans, October 29-31.

Special Society Elections.—Dr. Alan C. Woods, Baltimore, was named president-elect of the American Academy of Ophthalmology and Otolaryngology at its annual meeting in Chicago, October 12, and Dr. Gordon B. New, Rochester, Minn., was inducted into the presidency. New vice presidents include Drs. Edmund B. Spaeth, Philadelphia, William H. Johnston, Santa Barbara, Calif., and Major Brittain F. Payne, M. C. The next annual meeting will be held at the Palmer House, Chicago, Oct. 7-11, 1945.—Dr. William Bates, Philadelphia, was named president-elect of the United States chapter of the International College of Surgeons at its annual meeting in Philadelphia, October 4, and Dr. Rudolph Jaeger, Philadelphia, was inducted into the presidency. Other officers include Major Charles H. Arnold, M. C., secretary, and Dr. Benjamin I. Golden, Elkins, W. Va., treasurer. It was announced during the meeting that the international headquarters would be transferred from Geneva, Switzerland, to New York.

Courses for Orthopedic Surgeons.—The American Academy of Orthopaedic Surgeons has prepared a series of instructional courses to be presented at its annual meeting in Chicago, Jan. 20-24, 1945. The courses will deal with the shoulder, the hip, the knee and the foot. The instruction periods will deal first with the orthopedic anatomy, then with the practical application from the standpoint of symptoms and pathology, the treatment of disease conditions occurring in each one of these regions and finally the treatment of traumatic conditions. Four courses on physiology will be offered covering nerves, joints, bones and muscles as they pertain to various phases of orthopedic surgery. There will also be courses on infantile paralysis, spastic paralysis, fractures and x-rays in orthopedic surgery. On Saturday evening, January 20, the instructional course dinner will be held with an "information please" type of program of interest to military and civilian orthopedic surgeons. During the session a symposium on degenerative hip pathology is also planned as well as a series of talks on fractures, reconstruction surgery, treatment of infections and trauma.

Cancer Society Absorbs Foundation.—The recently formed National Foundation for the Care of Advanced Cancer Patients was absorbed October 10 into the American Cancer Society, according to the *New York Herald Tribune*. Under the arrangement, it was stated, the cancer society, which is 31 years old, will devote part of the funds collected nationally to provide care for incurable cancer patients of moderate means in addition to its present activities in supporting research and education in the prevention and cure of cancer. The merger was announced by Clarence C. Little, ScD., managing director of the American Cancer Society, and Julius J. Perlmutter, organizer and president of the national foundation, which was incorporated last May (*THE JOURNAL*, May 20, p. 221). It was stated that the organizations joined forces to avoid any confusion that might follow separate national campaigns for funds. The foundation will temporarily maintain its offices at 1450 Broadway, but its activities and records were to be transferred immediately to the cancer society's offices at 350 Madison Avenue. In an announcement Dr. Frank E. Adair, president of the American Cancer Society and vice president of the foundation, said that the former group will stimulate establishment of hospitals and homes to care for hopeless cancer patients and contribute funds for their support. Heretofore this organization has emphasized educational campaigns in the prevention and early detection of cancer, contributing to the support of cancer research and clinics throughout the country.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 4, 1944.

Compulsory Social Insurance from the Cradle to the Grave

As pointed out previously in *THE JOURNAL*, the scheme of the government for a national health service, which has produced the greatest crisis ever faced by the medical profession, is only one phase of the socialistic trend of British politics. The climax—for the present, at any rate—of this trend is the social insurance plan which has just been published. This is the Beveridge scheme, which has been described in *THE JOURNAL*, with some modifications. It extends compulsory social insurance to the entire population and so includes the millionaire as well as the humblest manual worker. Incidentally, this renders unlikely any favorable action on the demand from the profession that the upper 10 per cent of the population who do not require a national health service should not be included in it. The scheme will cost \$3,250,000,000 in the first year, increasing to \$4,155,000,000 in 1975. This will be provided by contributions from workers, employers, taxpayers and ratepayers. A Ministry of Social Insurance is to be set up as soon as possible. The main benefits will be as follows:

Sickness: Single man or woman or man with wife earning, \$5 a week; man with wife not earning, \$8; married woman earning, \$3; dependent's allowance, \$3.

Invalidity: Single man or woman or man with wife earning, \$4; man with wife not earning, \$7; married woman earning, \$3; dependent's allowance, \$3.

Unemployment: Single man or woman or man with wife earning, \$5; man with wife not earning, \$8; married woman earning, \$4; dependent's allowance, \$3.

Retirement Pension: Single man or woman or man with wife earning, \$4; man with wife not earning, \$7; married woman earning, \$4.

Family Allowances: \$1 a week for each child except the first; more school meals and milk.

Provision is also made for maternity, death, widows and orphans and industrial training.

At present twenty million employed persons are covered by insurance. The new plan, which extends insurance to everybody, will bring in another twenty-seven million. Each insured person will pay in the form of a stamp a single weekly contribution for all the benefits to which he is entitled. For employed men over 18 the total contribution will be \$1.50 weekly, of which nearly half will be paid by the employer. This figure includes 12 cents a week which men now pay under a separate industrial injury insurance scheme. The unemployment benefit will be payable for not more than thirty weeks continuously. For employed women the weekly contribution is \$1 a week, of which the employer pays more than half.

The government states that its first duty is to protect the country against aggression and the next is to secure the general prosperity and happiness of its citizens. Growth of the national power to produce, with accompanying opportunities for increased well-being, leisure and recreation, must be fostered, it is declared. Plans for the prevention of individual poverty resulting from those hazards of personal fortune over which individuals have little or no control must also be made by the government, it is held. Hence the need for social insurance. The stability of so vast a scheme depends on

strict administrative economy in every sense. This is not a matter for the government alone but requires the full cooperation of the public.

FAMILY ALLOWANCES

The proposals for family allowances are based on two principles: that nothing should be done to remove from parents the responsibility of maintaining their children and that it is in the national interest to help parents in discharging that responsibility. The scheme is not intended to provide full maintenance for each child but rather a general contribution to the needs of families with children. The purpose can be best fulfilled by giving a substantial part of the benefit in kind. The present school meals and milk will therefore be extended. It is estimated that this will increase the cost to \$300,000,000 a year—a figure which does not fall far short of the total cash allowances to parents. The first child is excluded from the flat rate allowance of \$1 a week because it is assumed that one child can be maintained from family earnings.

SICKNESS BENEFIT

Sickness benefit will be payable for the first three years of any continuous period of sickness. After that the lower rate of invalidity benefit will be paid. The government feels that sickness benefits of unlimited duration would be psychologically unwise and would tend to encourage persons subject to recurrent periods of sickness to lapse into chronic invalidity.

RETIREMENT PENSIONS

The prevention of want in old age is a policy on which the government sets great store. Government actuaries have estimated that in the twenty years from 1945 to 1965 the population of pensioners over working age will grow from 3,400,000 to 5,300,000, whereas the number of contributors will be practically stationary at about 21,000,000. In the ten years from 1965 to 1975 there will be a further increase of about 800,000 in the pensioners, while the contributor population will fall by over 1,000,000. These figures are based on the prewar birth and death rates. It may become a matter of vital importance to keep up the national income by encouraging the continuance of productive work by those who have reached the pensionable age. The government therefore proposes that for any one who works beyond the pensionable age and claims his pension later, the benefit rate will be increased by \$0.25 weekly for each extra year of work.

CONCLUSION

The government has expressed gratitude to Sir William Beveridge for his great work in preparing his comprehensive and imaginative report. The main tribute is the embodiment of so much of his plan in the proposals, which are believed to afford an adequate basis of social insurance for many years to come. They round off a notable chapter in the history of British social insurance, which since its beginning thirty-three years ago in the National Insurance Act has grown steadily in scope. The present scheme makes provision against every one of the main attacks which economic ill fortune can launch against individual well-being and peace of mind proponents of the plan maintain. They do not explain why the government worked out in detail this revolutionary plan of national compulsory insurance for all persons and for all purposes, from the cradle to the grave, during the greatest of all wars, which for a time placed the very existence of this country in danger. Some explanations are suggested, however. During the war all our activities have been severely controlled, so as to subordinate everything to victory. One result was the abolition of unemployment. So the argument arose "If the government can prevent unemployment in time of war, it can do so in time of peace." After the war of

1914-1918 the country was left to its own devices and there was a period of severe unemployment. The government has now assumed responsibility for dealing with unemployment by prevention or subsidy. In the second place, family allowances are designed to help parents in their responsibility and so encourage parenthood in the face of threatened decline of population.

Home Leave of Soldiers for Parenthood Resented

Much discontent has been caused among men of long service in the Middle East by what they regard as a gross interference with a man's most intimate private affairs. This arises out of publication of an order that married men with more than three years of service in the Middle East could obtain compassionate leave on the grounds that they wanted to return home "to start a family." Within a few days there were more than 1,000 applications. Three weeks later there was an amendment to the original order, which restricted posting to men whose wives were over 35 and who could show good reason why they had not started a family before the war. Wives and husbands were required to produce a medical certificate that they were willing and able to have children. Since this amendment, which makes it difficult for more than a handful of men to obtain posting, in spite of the fact that hundreds had already joyfully written home about the new facility, chaplains and welfare officers have found the men unhappy. What their wives in Britain will think is not difficult to imagine. Most of the soldiers, even the married ones, are willing to serve abroad for three years if necessary, owing to war conditions, but after that they want to go home. Nothing could be worse than the disappointment after hopes were raised by the original order.

BUENOS AIRES

(From Our Regular Correspondent)

Sept. 22, 1944.

Social Care of Patients with Heart Disease

The Department of Social Care to Cardiac Patients in Buenos Aires, of which Dr. Rafael A. Bullrick is the head, has a central department of social assistance and nine dispensaries in the Ramos Mejia, Rawson, Alvear, Pirovano, Durand, Salaberry, Alvares and Tornú hospitals. All the centers are well provided with the necessary means for preventing heart disease and for giving therapy to patients. The work carried on by the department during the last four and a half years is of great importance. The department is supported by the government, but donations are also given by the public. The department gives medical care to ambulatory patients, hospitalization for as long as it is necessary, medical care and guidance to pregnant and nursing mothers with heart disease and to children with heart disease and help in securing proper positions for young people with heart disease. Patients with heart disease who are unable to work and have no family to support them are admitted to institutions in which they will be given the necessary care.

National Department of Public Health

The National Department of Public Health and Social Assistance of Argentina was created Oct. 21, 1943 to supplant the National Department of Public Hygiene. Recently the government changed the functions of the department. From now on all work concerned with public beneficence and social care will be carried on in the Department of Social Assistance, which is a branch of the Secretariat of Work and Public Aid. The functions of the National Department of Public Health are concerned with the prevention and control of diseases. Dr. Eugenio A. Galli, head of the National Department of Public Health, has resigned; Dr. Manuel Augusto Viera has been appointed to the position.

Prevention of Typhoid

Vaccination against typhoid for all persons living in areas in which typhoid is frequent, including children over 3 years of age, became obligatory by a decree of the government which was recently published. A certificate will be given to all persons after vaccination. It should be shown by parents to teachers and by workers to employers. Managers and consulting physicians of working centers will be in charge of demanding the certificate as a requirement for admission to work. Persons who have suffered from typhoid in the recent past and those in poor health can refuse vaccination if they present a medical certificate to the vaccination department. The vaccination and proper medical after-care are given free of charge. The vaccine to be used is that prepared by the National Department of Public Health or any of the vaccines authorized by the National Department of Public Health. Private clientele will pay for vaccination at home. The period of time after which revaccination, either partial or total, is to be administered will be reported later. Infractions of the law will be punished by fines, which will be used to help defray the expenses of the antityphoid campaign. The incidence of typhoid in the Argentine army is negligible because the soldiers are given the vaccines when entering the army. Several cases of typhoid were reported from San Juan shortly after occurrence there of an earthquake in January 1944. Administration of vaccines soon after the cases were reported prevented further spread. The vaccine prepared by the Bacteriologic Institute of Buenos Aires is administered in three progressive doses.

Distribution of Penicillin in Argentina

Penicillin is not available to Argentine physicians; they have to order it from other countries. Penicillin is not produced in this country, although certain scientific institutions and pharmaceutical firms are carrying out laboratory and scientific studies on penicillin. Large amounts of it are to be sent in the near future from the United States to Argentina. No import duty will be charged. The National Department of Public Health appointed a committee in charge of the importation of the drug to Argentina, national distribution of the substance and supervision of prices. The committee sent formularies to physicians for obtaining the amounts of the drug which they may need for their patients.

Marriages

NORMAND EDMOND DUROCHER, Ecorse, Mich., to Miss Audrey Mae Brady of Gulfport, Miss., at Charlotte, N. C., September 3.

MARION AUGUSTUS BALDWIN, Fort Gaines, Ga., to Miss Elizabeth Frances Baldwin of Montgomery, Ala., in September.

GEOFFREY HERMAN BINNEVELD, Leesburg, Fla., to Miss Ellen May Whitt of Yalaha in Charlottesville, Va., September 15.

WILLIAM F. X. CAMPION, Brooklyn, to Miss Margarita Anita Corrigan of Bay Ridge, N. Y., September 16.

CHARLES ALOYSIUS ROGERS, Upper Montclair, N. J., to Miss Mary P. Robertshaw of Montclair, September 30.

JOHN G. CHESNEY to Miss Audrey Hasler, both of New York, in Montgomery, Ala., September 15.

BROOKE ROBERTS, Bala-Cynwyd, Pa., to Miss Anna W. Ingersoll in Whitmarsh, September 16.

WILLIAM SHERARD CHAPMAN to Miss Lois Elizabeth Smith, both of Florence, S. C., September 16.

JAMES R. FLAHERTY to Miss Kathryn M. Gully, both of Worcester, Mass., August 26.

CHARLES A. DE WERT to Miss Elizabeth L. Dunman, both of Cincinnati, September 14.

RICHARD V. DAUT to Miss Jean Wilkens, both of Muscatine, Iowa, September 28.

CLIFFORD T. SMITH to Mrs. Loine Arthur, both of Houston, August 23.

Deaths

James Addison Babbitt ☉ Haverford, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; emeritus professor of clinical otolaryngology at his alma mater and associate professor of otolaryngology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; served as professor of hygiene and physical education at Haverford College, becoming emeritus in 1928; member of the United States Football Rules Committee from 1906 to 1925; a fellow and one time president and secretary of the American Laryngological Association; fellow and past president of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otolological Society; fellow of the American Otolological Society, Inc., and the Philadelphia Laryngological Association; fellow and past chairman, executive committee, section on otolaryngology, College of Physicians of Philadelphia; fellow and member of the board of governors of the American College of Surgeons; during World War I served in France and Germany, working with the hospital service of the American Red Cross with the rank of major; specialist certified by the American Board of Otolaryngology; member of the courtesy staffs of the Bryn Mawr Hospital, Bryn Mawr, Presbyterian, Chestnut Hill and Methodist hospitals, Philadelphia; consulting otolaryngologist to the Mercy-Fitzgerald Hospital, Darby, Pa., Children's Hospital of the Mary J. Drexel Home, Children's Hospital, and Misericordia Hospital, Philadelphia; consulting otolaryngologist and acting chief, department of otolaryngology at the Lankenau Hospital, Philadelphia, where he died October 15, aged 74, of cerebral hemorrhage.

Edward Leonard Kickham ☉ Boston; Tufts College Medical School, Boston, 1923; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the New England Obstetrical and Gynecological Society and the Boston Obstetric Society; treasurer of St. Luke's Guild of Physicians; fellow of the American College of Surgeons; since 1930 instructor in gynecology at his alma mater; special lecturer at the Boston College School of Social Work; formerly surgeon of the fire department; served during World War I; senior obstetrician and gynecologist at Carney and St. Elizabeth's hospitals; gynecologist at the New England Medical Center; died in the Cardinal O'Connell House of St. Elizabeth's Hospital August 10, aged 49, of ulcerated colitis.

Denis Lane McAuliffe ☉ North Vernon, Ind.; Miami Medical College, Cincinnati, 1902; formerly instructor in anatomy and lecturer in medicine and materia medica at his alma mater; for thirty years secretary-treasurer and once president of the Jennings County Medical Society; for many years secretary of the Fourth District Medical Society; once president and for fifteen years secretary of the Tri-County Medical Society; member of the Southern Medical Association and the Mississippi Valley Medical Association; at one time county health officer; on the staff of the Schneck Hospital, Seymour, where he died September 18, aged 79, of myocardosis and bronchopneumonia.

Victor Lupu Schrager ☉ Chicago; Universitatea din Bucuresti Facultatea de Medicina, Rumania, 1901; Dearborn Medical College, Chicago, 1904; Rush Medical College, Chicago, 1907; associate professor of surgery at Northwestern University Medical School; professor of surgery at the Cook County Graduate School; formerly assistant professor of surgery at Rush Medical College; a founder member of the American Board of Surgery; a member of the Chicago Surgical Society; fellow of the American College of Surgeons; on the staffs of Mount Sinai, Garfield Park Community, Walther Memorial, Loretto and Cook County hospitals; died October 15, aged 66, of hypertension and heart disease.

Hiram La Mont Youtz, Webster City, Iowa; Johns Hopkins University School of Medicine, Baltimore, 1905; member of the Iowa State Medical Society; during World War I served overseas as a captain in the medical corps of the U. S. Army in command of Field Hospital number 40; honorably discharged in 1919; in 1935 assigned to active status as captain, medical reserve, Civilian Conservation Corps, in Iowa; served as college physician at the South Dakota State College, Brookings, for four years; died September 27, aged 69, of carcinoma of the sigmoid with metastasis to the liver.

Bertis Charles Gwaltney, Fort Branch, Ind.; Indiana University School of Medicine, Indianapolis, 1930; member of the Indiana State Medical Association; health officer of Gibson

County; in 1943 appointed assistant collaborating epidemiologist of Indiana; for thirteen years a teacher in various schools in Gibson County, including a year at Wolfe Lake in Northern Indiana, serving as principal at the Mackey High School; a director of the Lynnville National Bank; on the staff of the Gibson General Hospital, Princeton; died August 9, aged 50, of coronary thrombosis.

Arthur E. Bonesteel, Los Angeles; University of Denver Medical Department, 1894; member of the Colorado State Medical Society; formerly on the staff of St. Luke's Hospital in Denver; died July 31, aged 73, of cardiovascular disease.

Samuel Pierson Brush, Babylon, N. Y.; Albany Medical College, 1908; fellow of the American College of Surgeons; died July 5, aged 61, of arteriosclerosis.

Willard James Burns, Washington, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1897; member of the Medical Society of the State of Pennsylvania; died June 28, aged 77, of coronary thrombosis and acute gastritis.

George H. P. Christman, East Washington, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1881; member of the Medical Society of the State of Pennsylvania; served during World War I; died June 24, aged 85, of acute dilatation of the heart, arteriosclerosis and coronary disease.

Leo V. James Conlin, St. Paul; University of Minnesota Medical School, Minneapolis, 1931; health officer of North St. Paul and deputy coroner of Ramsey County; on the staffs of St. John's and St. Joseph's hospitals; died June 10, aged 43, of coronary occlusion.

Edward C. Gager, St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1905; member of the Minnesota State Medical Association and the Minnesota Dermatological Society; fellow of the American College of Physicians; clinical instructor in dermatology at his alma mater; chief, venereal disease clinic, Wilder Dispensary; attending dermatologist, Ancker Hospital; died in the Bethesda Hospital July 29, aged 61, of acute myocardial failure following an operation for intestinal obstruction due to gallstones in the ileum.

Henry J. Goodwyn, Carrollton, Ga.; Atlanta College of Physicians and Surgeons, 1902; member of the Medical Association of Georgia; president of the Carrollton Federal Savings and Loan Association; died June 24, aged 70, of carcinoma of the liver.

Charles M. Hanby, Wilmington, Del.; Southern Homeopathic Medical College, Baltimore, 1902; member of the Medical Society of Delaware; a member and for many years president of the city board of health; on the staffs of the Memorial, Delaware and Wilmington General hospitals; served as a member of the board of directors of the Alfred I. du Pont Institute of the Nemours Foundation; died July 27, aged 69, of coronary occlusion.

James I. Hembree, Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; died in the Crawford W. Long Memorial Hospital July 5, aged 54, of coronary thrombosis.

G. W. Holmsley, Comanche, Texas (licensed by years of practice); died July 8, aged 73.

William Brayton Holt ☉ Oak Ridge, Tenn.; University of Minnesota Medical School, Minneapolis, 1924; member of the Minnesota State Medical Association; formerly on the staff of St. Barnabas Hospital, Minneapolis; died July 26, aged 46, of congestive heart disease, coronary sclerosis and hypertension.

Ernest Walker Irving, Memphis, Tenn.; Meharry Medical College, Nashville, 1897; formerly inspector in city schools for the board of health; died July 18, aged 74, of angina pectoris.

Addison Le Clare Judd, Kanawha, Iowa; Keokuk Medical College, College of Physicians and Surgeons, Keokuk, Iowa, 1902; member of the Iowa State Medical Society; served on the staff of the Lutheran Hospital, Hampton; died July 27, aged 79, of senility.

Christopher C. Kesner, LeRoy, Kan.; Louisville Medical College, Louisville, Ky., 1884; served as local surgeon for the Missouri Pacific Railroad; died June 15, aged 87, of cerebral hemorrhage.

Lucas Allen Miller ☉ Colorado Springs, Colo.; the Hahnemann Medical College and Hospital, Chicago, 1898; first lieutenant in the medical reserve corps of the U. S. Army, not on active duty; died August 21, aged 76, of coronary thrombosis.

James Franklin Owens, Springfield, Mo.; Northwestern Medical College, St. Joseph, 1892; member of the Missouri State Medical Association; formerly lecturer at the Ensworth

Central Medical College; while a resident at St. Joseph, served as president of the board of public health, city health physician and county physician; died August 1, aged 74, of cerebral and gastric hemorrhages.

Edwin N. Reinert * Cleveland, Wis.; Milwaukee Medical College, 1902; died in the Memorial Hospital, Sheboygan, August 1, aged 67, of uremia and carcinoma of the prostate with metastasis.

William T. Rickman, Sapulpa, Okla.; University of West Tennessee College of Medicine and Surgery, Memphis, 1916; died in the Moton Memorial Hospital, Tulsa, June 17, aged 65, of cardiovascular disease.

Frederick Charles Roberts, Easton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; member of the Medical Society of the State of Pennsylvania; past president of the Northampton County Medical Society; at one time mayor of Easton; emeritus chief of the medical staff of Easton Hospital; died suddenly October 13, aged 74, of cardiac infarct.

Joseph Horace Shull, Stroudsburg, Pa.; Bellevue Hospital Medical College, New York, 1873; also a lawyer; state senator from 1886 to 1890; in 1904 elected to Congress as a representative for a term; served as president of the Monroe County Medical Society and the Monroe County Bar Association, on

John Sanders Taylor, Mount Pleasant, Texas (licensed in Texas under the Act of 1907); served as health officer of Mount Pleasant for many years; died June 19, aged 83, of heart disease.

Thomas L. Underwood, Sebastopol, Miss.; Memphis (Tenn.) Hospital Medical College, 1889; died July 27, aged 84, of mitral regurgitation.

Lee Wilbert Wiggins, Doraville, Ga.; Atlanta School of Medicine, 1908, member of the Medical Association of Georgia; served during World War I; on the staff of the Crawford N. Long Memorial Hospital, Atlanta; died in the Veterans Administration, Atlanta, July 20, aged 67, of hypertension and coronary arteriosclerosis, cerebral thrombosis with hemiplegia.

Maurice Houston Wilkinson, Los Angeles; the Hahnemann Medical College and Hospital, Chicago, 1915; formerly professor of internal medicine at the Illinois Post-Graduate Medical School, Chicago; served during World War I; captain, medical corps, Army of the United States, not on active duty, served on the staffs of various Veterans Administration facilities, died August 25, aged 55, of coronary occlusion.

David York Willbern, Runge, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1900; served on the school board for many years; died July 13, aged 73, of lobar pneumonia following a cerebral hemorrhage.



LILUT. FRANCIS J. BROCCOLO
(MC), U.S.N.R., 1917-1943



LILUT. (JG) HENRY B. LANDAAL
(MC), U.S.N.R., 1918-1944



CAPT. EUGENE FRANCIS HAVERTY
M. R. C., U. S. A., 1912-1944

the staff of the General Hospital of Monroe County, East Stroudsburg; died August 8, aged 95, of uremia.

Marvin R. Smith, Cordele, Ga.; University of Georgia Medical Department, Augusta, 1905; member of the Medical Association of Georgia; died July 12, aged 65, of acute dilatation of the heart.

W. Charles Willis, Allentown, Pa.; Eclectic Medical College of the City of New York, 1907; died July 2, aged 67.

Harry M. Wilson, Evans City, Pa.; University of Maryland School of Medicine, Baltimore, 1889; member of the Medical Society of the State of Pennsylvania; vice president of the Citizens National Bank; died July 25, aged 78.

KILLED IN ACTION

Francis Joseph Broccolo, Cicero, Ill.; Loyola University School of Medicine, Chicago, 1941; served an internship at the Cook County Hospital, Chicago, where he had been a resident in otology, laryngology and rhinology; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on Jan. 26, 1942, promoted to lieutenant Oct. 1, 1942; had been awarded the Silver Star; killed in action while at sea in the South Pacific area; aged 26; presumptive date of death, Oct. 13, 1943, according to the Navy Department.

Henry Byron Landaal, Waupun, Wis.; Medical College of Virginia, Richmond, 1943; served an internship at the State of Wisconsin General Hospital, Madison, commissioned a lieutenant (jg) in the medical corps, U. S.

Naval Reserve on April 6, 1943, killed in action off the coast of France June 9, aged 26.

Eugene Francis Haverty, Pittsburgh; Georgetown University School of Medicine, Washington, D. C., 1938; served an internship at the Mercy Hospital; formerly resident physician at the Children's Hospital, Cincinnati, and the Cincinnati General Hospital; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on June 18, 1938; began extended active duty on July 7, 1941 and assigned to the Station Hospital at Indiantown Gap, Pa.; later promoted to captain; had been stationed in England, Tunisia and Salerno, awarded the Legion of Merit and Silver Star for meritorious service at Anzio beach head, killed in action in Italy, February 29, aged 31.

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D.D.N.J. and foods, F.N.J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Hillys "H-R 5."—Morris William Hillinger, trading as Hilly Medicinal Products, Pasadena, Calif. Shipped Oct. 7, 1940. Composition: essentially small amounts of an ephedrine salt, caffeine, sodium phosphate, reducing sugars and water, with caramel coloring. Misbranded because despite the 0.31 grain of ephedrine hydrochloride present in each fluid ounce, the label failed to warn that frequent or continued use might cause nervousness, restlessness or sleeplessness, and that persons suffering from high blood pressure, heart disease or thyroid trouble should not use such drug except on competent advice. Further misbranded because of false and misleading statements in labeling, which represented that the product would be efficacious for use after overindulgence in alcohol, and in the cure, mitigation, treatment or prevention of alcoholism.—[D.D.N.J., F.D.C. 808; December 1943.]

Howell's Antiseptic Healing Oil.—Howell Company, Inc., New Orleans. Shipped between Feb. 21, 1940, and Jan. 6, 1941. Composition: essentially an oil containing camphor and 2.4 per cent of phenol. Adulterated because not possessing the phenol strength claimed and not antiseptic as represented by the name. Misbranded because label failed to warn that a bandage should not be used when product was applied to fingers and toes, and that it should be used according to directions and in no case on large areas of the body. Further misbranded because label statement "25% carbolic acid" and claim "Antiseptic" were false and misleading. Also misbranded because of claims on carton that preparation would relieve pain and soreness in carbuncles, erysipelas, boils and itch, and be efficacious for ulcers, old sores and skin eruptions.—[D.D.N.J., F.D.C. 807; December 1943.]

Mettozone Tablets.—Standard Drug Company, Inc., Spartanburg, S. C. Shipped Feb. 28 and March 13, 1941. Composition: essentially small amounts of extracts of plant drugs, including nux vomica, and a phosphide of some metal such as zinc. Misbranded because label did not warn against chronic phosphorus poisoning, which might follow the frequent or continued use of a product containing zinc phosphide, or against cantharides, the use of which might cause nausea, vomiting and abdominal pains, and seriously injure the kidneys, hence rendering it hazardous for use by persons afflicted with kidney disease; further misbranded because of false label representations regarding its alleged efficacy in the cure, mitigation, treatment or prevention of sexual debility.—[D.D.N.J., F.D.C. 805; December 1943.]

Nomo for Piles, Sanafrin and Asmolac.—Albert B. Hirschman, trading as Hirschman Laboratories and Sanafrin Laboratories, San Pedro, Calif. Shipped between May 14 and July 1, 1940. Composition: Nomo for Piles, essentially benzocaine, boric acid, eucalyptus oil, fixed oils, and zinc oxide; Sanafrin, essentially fat, zinc oxide, camphor and menthol; Asmolac, chiefly water, alcohol, plant extractives, alkaloids, reducing sugars and the iodides of potassium and sodium. Nomo for Piles misbranded because labeling falsely represented product as a competent treatment for all cases of hemorrhoids and as efficacious in relieving soreness and pain in that condition; further misbranded because labeling was misleading in not revealing that the preparation was not a treatment for all cases of hemorrhoids and that competent advice should be obtained in cases of excessive bleeding. Sanafrin misbranded because label falsely represented it as effective in treating chest colds and sore throat. Asmolac misbranded because directions for use mentioned no limitation as to duration of use, and because, though it contained iodine or iodides and the alkaloids of belladonna and hyoscyamus, the labels failed to warn that the product should be used with caution in the presence of certain conditions; further misbranded because directions falsely represented that, when used as directed in asthmatic spasms, it often would completely prevent these; also misbranded because labels did not declare the name and quantity or proportion of alkaloids of belladonna and hyoscyamus present.—[D.D.N.J., F.D.C. 757; September 1943.]

Re-Duce-Dids Capsules.—American Medicinal Products, Inc., Los Angeles. Shipped between April 7 and June 9, 1941. Composition: essentially a mixture of thyroid and potassium iodide (0.5 grain and 0.92 grain, respectively, per capsule), phenolphthalein and milk sugar. Misbranded because of false label representation that the mixture was an adequate and appropriate treatment for obesity.—[D.D.N.J., F.D.C. 783; September 1943.]

Sani-Cross Adhesive Strips and Tip Top Emergency First Aid Kits.—Gero Products, Inc., South Boston, Mass. Shipped Jan. 27 and April 28, 1942. The strips were adulterated because purity and quality fell below that which they purported to possess as being supposedly suit-

able for use on cuts and other wounds. Misbranded because falsely represented to be thus suitable. The Kits were adulterated because the absorbent cotton that they contained was not sterile but was contaminated with living bacteria, and hence fell below the standard of the United States Pharmacopeia. Misbranded because claims "First Aid Kit . . . For small cuts . . . Be Prepared for Emergencies" were false and misleading when applied to kits containing items which were not sterile. Further misbranded in that labels did not accurately declare quantity of contents, and containers were so made and filled as to be misleading.—[D.D.N.J., F.D.C. 795; September 1943.] Another consignment of Sani-Cross Adhesive Strips shipped by World Merchandise Exchange, New York, Oct. 9, 1941, was declared adulterated and misbranded for essentially the same reasons as those named above and reported under a separate Notice of Judgment 797.

Wise's Kollesol Tablets.—Wise's K. C. Homeopathic Pharmacy, Kansas City, Mo. Shipped Jan. 22, 1942. Composition: essentially oxyquinoline sulfate, potassium sulfate and lactose. Misbranded because labeling falsely represented that product would eliminate bacteria, guard against toxins and ptomaines, promote healing, provide healthy granulation with a minimum of scar tissue, control hemorrhage, prevent diphtheria and other infections, external and internal, and provide adequate medication in dentistry for toothache, pyorrhea, trench mouth, gingivitis and ulcerations, as well as diseases of the eye, ear, nose and throat, the genito-urinary tract and skin conditions including varicose ulcers, carbuncles, erysipelas, athlete's foot and some other things.—[D.D.N.J., F.D.C. 789; September 1943.]

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Right of Drugless Practitioner to Perform Hemoglobin Test.—The Board of Medical Examiners of California issued a "Drugless Practitioner's certificate of license" to King authorizing him to practice as a drugless practitioner. Subsequently an accusation was filed with the board, charging that King was guilty of unprofessional conduct in that on a stated day he penetrated the tissues of a stated patient in the treatment of a certain physical condition, that he had on stated occasions prescribed or administered drugs and that he had unlawfully used the title "doctor" or the prefix "Dr." After hearing, the board found the charges sustained and revoked King's license to practice. King then brought mandamus proceedings to review the order of revocation. The trial court found that the evidence warranted a finding of guilt only with respect to the unprofessional conduct in the charge that King had unlawfully used the title "doctor." This violation, the trial court held, however, was so trivial as to be insufficient to support the order of revocation entered by the board, and the trial court accordingly ordered that King's license should be suspended for six months only. King then appealed to the district court of appeal, first district, division 2, California.

The first count of the accusation filed with the board charged King with unprofessional conduct in that he did on a date specified "penetrate the tissues of" a stated patient "in the treatment of a certain disease, injury, deformity and other physical and mental conditions" in violation of the laws of the state relating to the practice of the healing arts. The evidence to support that charge was to the effect that King made a hemoglobin test of the blood of the person named, at a lecture that he was giving, by taking a drop of blood from the earlobe of that person, using what was vaguely described as "a long instrument similar to a pencil." He then compared the drop of blood so taken with a hemoglobin chart and told the person what the reading showed. No charge was made for the test. The question is thus presented, said the appellate court, as to whether or not the action of King constituted a penetration of the tissues within the intentment of that section of the Business and Professional Code which states that the penetration of the tissues of any human being by the holder of a drugless practitioner's certificate in the treatment of any physical or mental condition constitutes unprofessional conduct. In the opinion of the court, King's action in this respect constituted diagnosis, a procedure he was lawfully permitted to perform in view of the fact that among the educational requirements imposed on an applicant for a license to practice as a drugless practitioner is a requirement that he shall have taken at least a five hundred hour course in diagnosis in his so-called professional school and

in view of the fact that "even in the case of drugless practitioners," as said by the Supreme Court of California in *People v Jordan*, 172 Calif 391, 156 P 451, "Intelligent treatment may only follow correct diagnosis." The court also alluded to the fact that among the questions propounded in the examinations given applicants for licenses to practice as drugless practitioners are questions calling for the description of the Dick test and the Schick test. The court finally pointed out that the section prohibiting drugless practitioners to penetrate the tissues merely prohibits the penetration of the tissues "in the treatment of a disease or other physical or mental condition" and that there was no evidence presented that King's action came within the language of this section. The court was of the opinion that King's action in taking the hemoglobin test did not come within the letter or spirit of the law.

The second count of the accusation filed with the board charged unprofessional conduct on the part of King in that he did "prescribe, use or administer drugs or what are known as medicinal preparations, to wit 'Gland capsules 'Min-a-rex' and 'Vitamin' capsules . . . in the treatment of a disease, deformity or other physical condition." The members of the board were unanimous in voting that with respect to this count King was guilty as charged. This was done, said the appellate court, notwithstanding the fact that no evidence was offered relative to the use or prescription of any 'gland capsules' and that the undisputed evidence showed that the other compounds were not used "in the treatment of a disease, deformity or other physical condition." In the proceeding before the board to show that these compounds were "drugs or what are known as medicinal preparations," a state chemist testified before the board as to his chemical analysis of the contents of the mixture and concluded with the statement that "Min-a-rex" was "probably sea water or something of a similar composition." The undisputed evidence was that the "Vitamin Capsules" were food substitutes containing "wheat germ oil" and were sold by King in the original sealed package under the trademark of the manufacturer without other representation than what was printed on the label. No evidence was introduced to prove that they were prescribed or used for the purposes denounced in the code, namely, "in the treatment of any physical or mental condition of the human being." Further, as indicative that there was a complete failure of proof of the charges made in this count, the court noted that the board denied King the right to present evidence of two essential elements of his defense, namely, that no drugs or medicines were used in the treatment of any disease or physical condition and that the packages sold met the requirements of the pure food laws of the United States and of the state. If King had been permitted to make this proof, the court concluded, no reasonable person could have found him guilty of a charge of using drug or medicinal preparations in the treatment of any physical or mental condition and the denial of that right was arbitrary, unreasonable and a breach of discretion on the part of the board.

The third count of the accusation filed with the board charged King with violating section 2409 of the Business and Professions Code, which reads as follows:

Unless a person licensed and authorized under this chapter or any preceding medical practice act to use the title 'doctor' or the letters or prefix 'Dr.' holds a physician's and surgeon's certificate, the use of this title or these letters or prefix without further indicating the type of certificate he holds, constitutes unprofessional conduct within the meaning of this chapter.

The accusation, said the court, does not allege that King was "licensed" under any act "to use the title 'doctor' or the letters or prefix 'Dr.'" The license was not offered in evidence. The accusation filed with the board alleged and the answer admitted that King was issued a "Drugless Practitioner's certificate of license" authorizing him to practice as a drugless practitioner. It does not appear either in the statute or in the record that such license authorized King to use the title "doctor" in any form. The purpose of the statute is clear. If a person is licensed under any medical practice act to use the word "doctor" in relation to a profession other than that of physician or surgeon, he must indicate the type of certificate he holds. The court was unable to find any provision in the law or of any "preceding medical practice act" which authorizes any agency

to license a drugless practitioner to use the word "doctor" or the prefix "Dr." and, unless such a license has been issued the court held the section does not apply. It seems apparent, said the court, that the purpose of the section was to prevent misrepresentations and fraud and that there was no intent to appropriate these titles to the exclusive use of those who held the certificate of a physician or surgeon. Thus we have doctors of medicine, doctors of philosophy and many other types of "doctors" who are not licensed under any medical practice act and therefore not included in this section.

The court accordingly held that the revocation of King's license was not warranted. The court further held that the trial court had erred when it ordered the suspension of King's license. By the terms of the Business and Professions Code, said the court, all disciplinary action with respect to physicians and surgeons and drugless practitioners is lodged with the board of medical examiners, and a court reviewing the orders of the board is without power to substitute its discretion for that of the board in the matter of the form of discipline to be imposed. The appellate court in effect reversed the order of the board of medical examiners revoking King's license to practice—*King v Board of Medical Examiners*, 151 P (2d) 282 (Calif, 1944).

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and of Examining Boards in Specialties were published in *THE JOURNAL*, October 28, page 589.

BOARDS OF MEDICAL EXAMINERS

- ALASKA Juneau March Sec, Dr W M Whitehead Box 561 Juneau
ARKANSAS * Little Rock, Nov 9 10 Sec, Dr D L Owens Harrison
CALIFORNIA Oral San Francisco, Nov 15 Sec, Dr Frederick N Setten 1020 N St Sacramento 14
CONNECTICUT * Medical Written Hartford Nov 14 15 Endorsement Hartford, Nov 28 Sec to the Board Dr Creighton Barker 238 Church St New Haven Homeopathic Derby, Nov 14 15 Sec, Dr J H Evans, Hartford 6
DISTRICT OF COLUMBIA * Washington November Sec, Commission on Licensure, Dr G C Ruhland 6150 E Municipal Bldg Washington
FLORIDA * Jacksonville, Nov 20 21 Sec, Dr Harold D Van Schick 2736 S W Seventh Ave, Miami 36
IDAHO Boise, Jan 8 11 Dir, Bureau of Occupational Licenses, Mrs Lela D Painter, 355 State Capitol Bldg, Boise
INDIANA Indianapolis, Jan 35 Exec Sec, Board of Medical Registration and Examination, Miss Ruth A Kirk, 301 State House Indianapolis 4
MAINE Portland Nov 14 15 Sec, Board of Registration of Medicine, Dr A P Leighton 192 State St Portland
MARYLAND Homeopathic Baltimore Dec 13 Sec, Dr John A Evans, 612 W 40th St, Baltimore
MASSACHUSETTS Boston, Nov 14 17 Sec, Board of Registration in Medicine, Dr H Q Gullupe 413 F State House, Boston
NEVADA Carson City, Nov 6 Sec, Dr G H Ross 215 N Carson St Carson City
NORTH DAKOTA Grand Forks, Jan 25 Sec, Dr G M Williamson 43 3rd St Grand Forks
SOUTH CAROLINA Columbia, June 25 27 Sec, Dr N B Heyward, 1329 Blandina St, Columbia
SOUTH DAKOTA * Pierre, Jan 16 17 Sec, Medical Licensure, State Board of Health, Dr G Cottam Pierre
TEXAS Dallas, Nov 15 17 and Dec 19 21 Sec, Dr T J Crowe, 918 20 Texas Bank Bldg, Dallas 2
VERMONT Burlington June Sec Dr F J Lawless Richford
VIRGINIA * Richmond, June 20 23 Sec, Dr J W Preston 303 1/2 Franklin Rd, Roanoke
WASHINGTON * Seattle Jan 15 17 Dir, Department of Licenses, Mr Thomas A Swazze, Olympia
* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

- COLORADO Denver Dec 6 7 Sec Dr Esther B Strick 1419 Ogden St Denver
IOWA Des Moines Jan 9 Dir Division of Licensure and Registration Mr H W Grefe Capitol Bldg Des Moines
NEW MEXICO Santa Fe, Feb 12 Sec, Miss Marion M Rhea, State Capitol Santa Fe
RHODE ISLAND Providence, Nov 15 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence
SOUTH DAKOTA Aberdeen, Dec 12 Sec, Dr G M Evans, Yankton
TENNESSEE Memphis and Nashville, Dec 18 19 Sec, Dr O W Hyman 874 Union Ave Memphis
WISCONSIN Milwaukee Dec 2 Sec, Prof R A Bauer, 152 W Wisconsin Ave, Milwaukee 3

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Physiology, Baltimore 141:613-750 (July) 1944

- Factors Responsible for Intestinal Phase of Gastric Secretion. W. D. Beamer, M. H. F. Friedman, J. E. Thomas and M. E. Rehfuess. —p 613
- Some Factors Affecting Resistance of Ejaculated and Epididymal Spermatozoa of Boar to Different Environmental Conditions. J. F. Lasley and R. Bogart —p 619
- Comparison of Direct and Indirect Blood Pressure Measurements in Rats. R. H. Shuler, H. S. Kupperman and W. F. Hamilton —p 625
- Lactate Response to Exercise and Its Relationship to Physical Fitness. T. Crescitelli and C. Taylor —p 630
- Effect of Some Internal Factors on Human Work Output and Recovery. E. E. Foltz, I. T. Jung and Lillian E. Cister —p 641
- Effect of Manganese Intake on Concentration of Bisulfite Binding Substances in Blood. J. T. Skinner and J. S. McHargue —p 647
- Response to Chilling and Recovery in Adrenalectomized Cats. F. A. Hartman and Katharine A. Brownell —p 651
- Metabolism of Acetone Bodies and Glucose in Vitro and Effect of Anterior Pituitary Extract. R. A. Shupley —p 662
- Kidney as Locus of Fructose Metabolism. R. M. Reinecke —p 669
- Effect of Blood Withdrawal and Replacement on Bleeding Volume of Normal Dogs Under Barbitural Anesthesia. H. Lawson —p 677
- Effects of Excitement, of Epinephrine and of Sympathectomy on Mitotic Activity of Corneal Epithelium in Rats. J. S. Friedenwald and W. Buschke —p 689
- Determination of Blood and Plasma Volume Partitions in Growing Rat. J. Metcalf and C. B. Favour —p 695
- Effects of Nembutal and Yohimbine on Chronic Renal Hypertension in Rat. Racheal K. Reed, L. A. Sapirstein, F. D. Southard Jr. and E. Ogden —p 707
- Plasma, Gelatin and Saline Therapy in Experimental Wound Shock. W. W. Swingle and W. Klemberg —p 713
- Circulatory Collapse Following Mechanical Stimulation of Arteries. R. T. Rushmer —p 722
- Secretion of Pancreatic Juice After Cutting Extrinsic Nerves. J. O. Crider and J. E. Thomas —p 730

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill. 52:123-244 (Aug.) 1944

- Effect of Roentgen Rays on Minute Vessels of Skin in Man. E. P. Pendergrass, P. J. Hodess and J. O. Griffith —p 123
- *Determination of Placental Site in Bleeding During Last Trimester of Pregnancy. J. J. McCort, C. N. Davidson and H. J. Walton. —p 128
- Non-secreting Cysts of Maxillary Sinuses, with Special Reference to Roentgen Aspects and Diagnosis of Large Types. J. W. Grossman and H. D. Waltz —p 136
- Postoperative Emphysematous Bullae Following Lung Abscess. W. R. Oechsli —p 145
- Difficulties in Roentgenologic Examination of Biliary Tract. A. J. Bengoley, C. V. Suarez and A. Negri —p 149
- *March Fracture. Analysis of 166 Cases. F. H. Tyner and W. T. Hileman —p 165
- Roentgenographic Studies of Cervical Spine. L. A. Hadley —p 173
- Effect of Increased Intraspinal Pressure on Movement of Iodized Oil Within Spinal Canal. B. S. Epstein —p 196
- Osteoid Osteoma of Head of Radius. Case Report. H. M. Stauffer. —p 200
- Military Roentgenologic Training. H. G. Moehring —p 203
- War-time Graduate Medical Meetings. E. L. Bortz —p 205
- Simple Method for Measuring Peak Voltage in Diagnostic Roentgen Equipment. R. H. Morgan —p 208

Determination of Placental Site in Bleeding During Pregnancy.—McCort and his associates review roentgenologic studies on 132 patients with the presenting symptom of bleeding during the last trimester of pregnancy. The accuracy of this method of examination was 87.8 per cent, with best results in the group diagnosed as negative for placenta previa (97 per cent). The roentgen examination for placenta previa has proved to be a valuable adjunct to the sterile pelvic examination. The two examinations are somewhat complementary. The former enables the obstetrician to treat bleeding cases with greater exactitude. A soft tissue roentgenographic study of the abdomen is first made. If, after careful study, the main portion of

the placenta is found to lie in the fundus, it is reported as negative for placenta previa and no further examination is made. If the placenta is not visualized in this position, an air cystogram is done to determine if there is any tissue intervening between the fetal head and the bladder wall. The following signs are of value in positive diagnosis of placenta previa: (a) failure to visualize the placenta in the body of the uterus; this suggests central placenta previa; (b) location of mass of placenta below the equator of the uterus; (c) widening of sacral promontory-fetal head distance when the placenta is implanted on the anterior wall; (d) widening of symphysis pubis-fetal head distance when the placenta is implanted on the anterior wall; (e) widening of the vesicocephalic distance seen after pneumocystography; (f) lateral displacement of the bladder seen after pneumocystography; (g) displacement of the fetal head from the midcoronal and sagittal planes.

March Fracture.—Tyner and Hileman observed between April 1941 and June 1943 166 cases of march fracture of the metatarsal bones. All current theories concerning the production of march fractures give due importance to the small repeated traumas incurred in long marches, but all authors agree that some other factor must be involved. "Physiologically inadequate" feet, abnormal length of metatarsals, overload, neurogenic influences, inflammatory processes and the handicap of a previously sedentary occupation of the patient have been mentioned as possible causative factors. The authors evaluated these possible causes in their cases. The most frequent site of fracture was at the distal third of the third metatarsal. The age distribution appears closely correlated to the age distribution in the Army and is therefore not considered of significance in the etiology. No neurologic disturbances or infections could be discovered. Prior occupation and length of service were studied in 20 cases. The duration of training time spent taking long hikes and forced marches averaged twenty-seven weeks. The patients' former occupations ranged from coffin making to dress designing and did not appear of significance. The 20 men who were interviewed personally reported that they had completed several miles of marching and that muscle fatigue had set in before the onset of symptoms. Studies on the blood chemistry of 12 patients revealed that the serum phosphatase levels averaged 6.48 units. This slight increase may be due to the stimulus of healing fractures. It is apparent from these studies that age, previous occupation, neurologic disturbances, bony anatomy of the feet and bone metabolism cannot be important etiologic factors. The authors think that due consideration has not been given to the fact that bones cannot stand great stresses unless they are adequately supported by muscles. When muscles of the foot and leg are fatigued, the weight of the body is thrown directly on the metatarsal bones, while the arches are flattened by the loss of muscular tone. All of the 20 men concerning whom information was available experienced fatigue before the pain of fracture occurred. This makes the authors believe that muscle fatigue as it occurs during long marches is the principal cause of march fractures.

American Journal of Surgery, New York

65:153-302 (Aug.) 1944

- *Functional Parathyroid Tumors and Hyperparathyroidism. Clinical and Pathologic Considerations. H. B. Alexander, J. de J. Pemberton, E. J. Kepler and A. C. Broders —p 157
- Management of Postoperative Urinary Tract Complications. E. E. Ewert and H. A. Hoffman —p 189
- Motion Study in Surgery. F. B. McCarthy —p 197
- *New Technique for Instilling Amniotic Fluid Concentrate Intra Abdominally at Close of Operations. 27 Case Reports. H. J. Merkle —p 210
- Fractures of Femur. Results of Treatment of 179 Patients. H. A. Swart and G. Miyakawa —p 221
- Effects of Sulfanilamide and Azochloramide on Hemolytic Streptococci and Staphylococci in Wounds of Rabbits. E. R. Neter, R. S. Hubbard and T. G. Lamberti —p 226
- Benign Tumors of Stomach. E. B. Dewey —p 233
- Psychology of Patient Undergoing Plastic Surgery. A. J. Barkley —p 238
- Fractures of Jaw. Analysis of 212 Cases. W. A. Coakley and J. M. Baker —p 244
- Treatment of Fractures with Haynes Splint. M. K. King —p 248
- Use of Curare in Anesthesiology. L. Watter —p 253

Parathyroid Tumors and Hyperparathyroidism.—Alexander and his associates present the histories of 14 instances of hyperparathyroidism due to functioning parathyroid tumors which were treated at the Mayo Clinic up to November 1942.

In 2 cases there was fatal termination, while in 12 the results of operative treatment were excellent. The authors stress the widely divergent clinical pictures which may be presented by patients with hyperparathyroidism. No single symptom or sign should be regarded as decisive. Single findings of concentrations of calcium less than 12.5 mg. per hundred cubic centimeters of serum were encountered in 4 of the 14 cases of proved hyperparathyroidism. The authors stress the importance of the relation between the serum protein level and the serum calcium level. Depression of the value for serum phosphorus, measured as inorganic phosphate, is the rule in cases without gross impairment of renal function. The serum alkaline phosphatase level is elevated in proportion to the degree of involvement of bone. The Sulkowitch test provides a rough estimate of the presence or absence of excess urinary excretion of calcium. Considered alone it is not diagnostic of hyperparathyroidism. Bone changes in hyperparathyroidism appear to be an index more of the duration of the disease than of its severity. The incidence of renal lithiasis in hyperparathyroidism is about 60 per cent. In 13 of the 14 cases the tumor showed cytologic evidence of cancer. No correlation was found to exist between the weight of the tumor and the degree of hyperparathyroidism as measured by the concentration of calcium in the serum before operation. The average weight of the tumors was 18.2 Gm. They were encapsulated and usually were brown. Four were in the mediastinum, 3 being posterior and 1 anterior. Cytologic evidence of cancer was seen in chief cells, oxyphil cells and foam cells. Such evidence included irregularity of size and staining power of the nuclei, a densely staining chromatin network, giant nuclei, mitotic figures, pathologic mitoses, prominent nucleoli, irregular cellular arrangement and invasion of the capsule and blood vessels by tumor cells. The type of cell predominating in the tumor did not appear to affect the clinical picture. The authors stress the necessity of complete operative removal of parathyroid tumors.

Instilling Amniotic Fluid at Close of Operations.—Merkle points out that one of the chief functions of amniotic fluid in its natural location is to prevent adhesions between the amniotic sac and the fetus. He describes 27 abdominal operations in which amniotic fluid concentrate was instilled intra-abdominally immediately before the peritoneum was closed. Instillation in the first 8 cases was attempted by the funnel and catheter method, the fluid reaching the peritoneum by gravity. In the remaining cases the fluid was instilled through a specially designed trocar, positive pressure being substituted for gravity. The latter method proved preferable.

Annals of Allergy, Minneapolis

2:281-364 (July-Aug.) 1944

- Qualitative Differences Among Canine Danders. S. B. Hooker.—p. 281.
Histopathology of Eczematoid Dermatoses. W. Sachs, C. S. Miller and Margaret Gray.—p. 289.
Precipitation of Pulmonary Edema by Overdose of Antigen in Patient with Rheumatic Mitral Disease. K. J. Deissler.—p. 299.
*Psychiatric Studies in Clinical Allergy. E. A. Brown and R. L. Goitein.—p. 303.
Pollination of Anemophilous Trees in New Orleans. W. T. Penfound.—p. 315.
Severe Urticarial Reactions Due to Pooled Human Plasma: Report of Case. B. Dickstein.—p. 327.
Contact Dermatitis from Rubber Gas Mask. J. C. Gilbert.—p. 339.
Subcutaneous Emphysema During Asthma. M. Francis.—p. 342.
Localized Atrophy of Subcutaneous Fat After Repeated Injections of Grass Pollen. N. Francis.—p. 344.

Psychiatric Studies in Clinical Allergy.—Brown and Goitein discuss the psychiatric components of allergic personality. The authors demonstrated the existence of a special type of personality prone to asthmatic attacks. A sample population of asthmatic subjects and an equal number of nonasthmatic allergic subjects were classified for normal personality variables. The asthmatic patient had a somewhat greater tendency than the normal to be left handed and to marry and was subject to emotional instability when compared either with other allergic patients or with the normal population of the same age and social group. All the patients seem to be of average intelligence; but in 43 per cent the personality deviated from the normal and showed trends constituting abnormal or psychiatric

personalities. The abnormal aspects of personality were now tested for by an independent technic. The neurotic elements of deviation were determined separately by a psychiatric assessment of the patient and his background. This gave a score which indicated the degree of severity of the attendant neuroses. Psychiatric inquiries differentiated an abnormal personality of a special stamp (obsessive and paranoid). Neurotic and emotional maladjustment was discernible in 43 per cent of the asthmatic subjects as compared with 10 per cent in the control patients and 47 per cent in the allergic nonasthmatic subjects. Current neuroses were diagnosed in 20 per cent of the patients. The neuroses in allergic nonasthmatic patients totaled 16 per cent. These neuroses took the form of hypochondriasis, obsessionalism, conversion and anxiety-hysteria and (among the allergic nonasthmatic patients) vague anxiety symptoms, depression, obsessionalism and hysteria. In both groups the emotionally stable section admitted to a feeling of improvement as a result of physical treatment and seemed less inclined to mental resistance and obstinacy. They lacked the sense of dissatisfaction which was noted in the unstable section. The hysteroid type was more evident in the allergic neurotic patients and the obsessive type among the asthmatic neurotic patients.

Archives of Dermatology and Syphilology, Chicago

50:79-150 (Aug.) 1944

- Contact Testing of Buccal Mucous Membrane for Stomatitis Venenata. L. Goldman and B. Goldman.—p. 79.
Ichthyosiform Atrophy of Skin in Hodgkin's Disease: Report of Case, with Reference to Vitamin A Metabolism. A. J. Glazebrook and W. Tomaszewski.—p. 85.
Rat Mite Dermatitis: Acariasis Caused by Tropical Rat Mite, *Liponyssus Bacoti* Hirst, 1914. C. R. Anderson.—p. 90.
Tuberculous Sclerosis: Report of Case. Z. B. Noon and O. O. Williams.—p. 96.
Kaposi's Varicelliform Eruption: Review of Literature and Report of 2 Cases of Its Occurrence in Adults. R. L. Barton and L. A. Brunsting.—p. 99.
Juxta-Articular Nodules. H. D. Chambers.—p. 105.
Impetigo Herpetiformis in Male: Report of 1 Case with Response to Sulfapyridine. A. F. Hall.—p. 107.
Prurigo of Hebra (Severe Type). B. Kanev.—p. 113.
Superficial Epitheliomatosis: Report of Case. S. L. Weisman and L. S. Medalia.—p. 117.
Lichen Sclerosus et Atrophicus: Report of Its Occurrence in Negro. S. Irgang.—p. 120.
Contact Dermatitis Produced by Tincture of Merthiolate. L. Hollander.—p. 123.

Archives of Internal Medicine, Chicago

74:1-80 (July) 1944

- *Treatment of Scarlet Fever. M. J. Fox and N. F. Gordon.—p. 1.
Recovery from Multiple Rheumatoid Arthritis Complicated by Amyloidosis in Child: Report of Case and Review of Literature. A. Trasoff, N. Schneberg and M. Scarf.—p. 4.
Actinomycosis of Heart Simulating Rheumatic Fever: Report of 3 Cases of Cardiac Actinomycosis, with Review of Literature. A. Conell and H. B. Shookhoff.—p. 11.
Sickle Cell Disease: I. Observations on Behavior of Erythrocytes in Sickle Cell Disease. R. C. Murphy Jr. and S. Shapiro.—p. 28.
Blood: Review of Recent Literature. F. H. Bethel, C. C. Sturgis, O. T. Mallory Jr. and R. W. Rundles.—p. 36.

Treatment of Scarlet Fever.—Three types of therapy for scarlet fever are available: (1) chemotherapy with sulfonamide compounds, (2) administration of commercial antitoxin and (3) administration of convalescent serum. Fox and Gordon evaluate these methods in an analysis of results obtained in 7,500 scarlet fever patients hospitalized at the South View Hospital in Milwaukee during the years between 1937 and 1943. Sulfonamide compounds find their chief value in the treatment of certain complications. These drugs are of no value in the management of the toxic phase or type of scarlet fever. The use of commercial antitoxin, prepared with horse serum, combats the toxic phase of the disease but introduces the danger of foreign protein reactions. Pooled human convalescent serum produces rapid clinical response and offers the best means of therapy. Of the 7,500 patients, 1,000 had received pooled human convalescent serum. To evaluate the effect of serum therapy, 1,000 consecutive cases were chosen from the hospital records for comparison. These control cases were deliberately selected from the year 1923, when only symptomatic treatment could be used, since antitoxin, convalescent serum and sulfonamide com-

pounds were not then available. The series of 1,000 patients of 1937 to 1943 contained a far higher percentage of seriously ill persons than did the 1,000 patients of 1923. Eighty-eight and six tenths per cent of the patients treated with serum were severely ill, in contrast to only 20.3 per cent of the control series. Notable beneficial effects of pooled convalescent serum included prompt subsidence of fever, alleviation of signs and symptoms, avoidance or improvement of complications, shortened period of hospitalization and lower mortality rate. The last mentioned consideration is especially significant in view of the fact that the lower mortality rate was obtained in a group of patients who were more severely ill. Smaller doses of convalescent serum than have been previously used have been found to be effective.

Archives of Neurology and Psychiatry, Chicago

52:87-162 (Aug.) 1944

- Clinical and Pathologic Features of Gliomas of Spinal Cord. H. A. Shenkin and B. J. Alpers.—p. 87.
Effects of Stimulation and Lesion of Median Longitudinal Fasciculus in Monkey. M. B. Bender and E. A. Weinstein.—p. 106.
Effect of Insulin Hypoglycemia on Glycogen Content of Parts of Central Nervous System of Dog. Annette Chesler and H. E. Himwich.—p. 114.
Photie Driving. A. E. Walker, J. I. Woolf, W. C. Halstead and T. J. Case.—p. 117.
Post-Traumatic and Histamine Headache. A. P. Friedman and C. Brenner.—p. 126.
Multiple Transfusions for Schizophrenia. A. Z. Pfeffer and M. J. Pescor.—p. 131.
Spinal Cord Level Syndrome Following Intrathecal Administration of Magnesium Sulfate for Tabetic Crisis: Report of Case, with Necropsy. S. A. Guttman and A. Wolf.—p. 135.
Rapid Head Movement Test of Equilibratory Function. G. H. Hyslop.—p. 140.

Archives of Otolaryngology, Chicago

40:75-156 (Aug.) 1944

- Labyrinthitis Due to Pneumococcus Type III: Histopathologic Studies. F. Altmann and J. G. Walner.—p. 75.
Histopathology of Nasal Mucosa of Older Persons. A. R. Hollender.—p. 92.
*Ménière's Syndrome: Results of Treatment with Nicotinic Acid in Vasoconstrictor Group. M. Atkinson.—p. 101.
*Hereditary Hemorrhagic Telangiectasia (Osler's Disease): Review of Literature and Report of Cases. M. F. Stock.—p. 108.
*Vitamin C-Sulfonamide Compounds in Healing of Wounds: Use of Sulfanilamide Ascorbate in Treatment of Chronic Suppuration of Wound After Radical Mastoidectomy. S. L. Ruskin.—p. 115.
Epistle on Organs of Hearing by Bartholomaeus Eustachius: Dedicated to Francis Alciatus, Bishop of Milan During Reign of Pope Pius IV. G. O. Graves and M. E. Galante.—p. 123.
Carcinoma of Larynx: Review of Treatment and End Results at Brooklyn Cancer Institute. W. E. Howes and M. Platau.—p. 133.
Tumors of Nose and Throat. G. B. New and E. L. Foss.—p. 142.

Ménière's Syndrome.—Atkinson maintains that in cases of idiopathic Ménière's syndrome one of two vascular mechanisms is at work, a primary vasodilator and a primary vasoconstrictor mechanism. These two groups can be differentiated by means of an intradermal test with histamine. The treatment appropriate to one group is inappropriate and deleterious to the other. Therefore accurate grouping is a prime requisite for effective therapy. The satisfactory results obtained by desensitization to histamine in the primary vasodilator group have already been published. This paper is concerned with the treatment in the primary vasoconstrictor group. The series reviewed comprises 110 patients observed between January 1940 and June 1943. All have been under personal observation. They have the idiopathic syndrome, they were proved to be insensitive to histamine and thus belong to the primary vasoconstrictor group. The author found nicotinic acid to be the most effective vasodilator drug. Its action is at the periphery of the vascular system. This distal effect is wanted, since it is the circulation in the capillaries of the stria vascularis which is believed to be at fault in this condition, at least as far as concerns the aural manifestations. It is essential to use nicotinic acid, not nicotinamide. Whereas the two substances are interchangeable as regards their vitamin effect, they are not interchangeable as regards vasodilator effect. The most efficacious method is to start with injections and gradually wean the patient to oral medication. The author discusses the indications for the intra-

venous, the intramuscular and the oral medication. The 110 patients were treated medicinally exclusively with nicotinic acid. The attacks of vertigo were relieved or greatly modified in 84 per cent of the cases.

Hereditary Hemorrhagic Telangiectasia (Osler's Disease).—Stock defines hereditary hemorrhagic telangiectasia as a rare disease, probably due to mesenchymal dysplasia, which is characterized by the presence of multiple acquired angiomas or telangiectasis of varying distribution and number with a tendency to bleed spontaneously or from slight trauma. It is transmitted as a dominant characteristic. The initial symptom usually consists of abnormally profuse epistaxis beginning at about puberty. This is followed by the development of multiple telangiectasias of the skin and mucous membranes from the age of 25 to 35. All symptoms tend to reach their greatest severity during the fourth decade. The author presents a review of the literature from 1933 to 1944 and adds 7 cases, which were gathered during the past two and a half years in his own otolaryngologic practice. In about 20 per cent of the recorded cases the disease probably developed in the absence of a family history. Whether these patients can transmit the disease to their progeny is not known. The author adds to the literature the third recorded instance in the last eleven years in which the disease can be traced through six generations in one family. The extreme rarity of this, together with the fact that the disease has become progressively milder during the last two generations in this family, suggests self limitation of the hereditary transmission. The disease is generally regarded as simple ectasia of preexisting vascular channels, but it is not improbable that the lesions are actually multiple acquired neoplastic angiomas arising from endothelial rests of embryonal origin. This is suggested by the following observations: Epistaxis usually predates the development of visible mucosal or cutaneous lesions; satellite lesions develop in the region adjoining the site formerly occupied by angiomas destroyed by treatment; the lesions have a universal distribution and some are of great size; they have a tendency to disappear spontaneously while new angiomas appear; the microscopic and biomicroscopic pictures suggest neoplastic development; there is a slow and incomplete but definite response to roentgen therapy. The newer methods of treatment include electrolysis, roentgen or radium irradiation, microinjection of sclerosing solutions and parenteral administration of moccasin venom. The author observed good results in the single patient who was treated with roentgen rays by the "intermediate" method. The literature includes many references to a possible relationship between Osler's disease and other diseases due not only to possible mesenchymal but also to possibly associated ectodermal dysplasia. These postulates have not been proved. The author thinks that more widely disseminated knowledge of the disease will result in its more frequent recognition and diagnosis.

Vitamin C-Sulfonamide Compounds in Healing of Wounds.—Ruskin reviews the literature on the role of vitamin C in the healing of wounds. He believes that the local effect of the ascorbic acid is independent of the systemic level of vitamin C. Vitamin C locally applied to wound tissue presents an additional factor in healing. The relationship of ascorbic acid to the bacteria in the wound area has been investigated, and the conclusion has been reached that ascorbic acid serves as a detoxicating agent. The possibility of using vitamin C in chemical combination with the sulfonamide drugs opened up a most interesting avenue of investigation. The chemical properties of ascorbic acid are such as to reduce the alkalinity of the sulfonamides. The vitamin also lends a hygroscopic factor which tends to prevent caking of sulfanilamide, thus prolonging uniform absorption. In order to have visual control of the advantages of the sulfonamide ascorbate, the drug was used in chronic, nonhealing wounds of long standing, in which bone would particularly be involved. Such easily visualized wounds involving bone are found in unhealed cavities following radical mastoidectomies and in ears with chronic suppurative otitis media and defects of the drum membrane. The routine procedure was to irrigate the ear cavity, dry the area and then fill the mastoid cavity, the middle ear and the external canal with the sulfanilamide ascorbate. The author presents a number of cases which indicate that sulfanilamide ascorbate and sulfathiazole ascorbate both stimulate healing with epithelization.

California and Western Medicine, San Francisco

61:49-128 (Aug.) 1944

- New Problems in Field of Industrial Toxicologist. Alice Hamilton.—p. 55.
Hormones and Skin. I. R. Bancroft.—p. 60.
Scrub Typhus. A. C. Reed.—p. 62.
War Anesthesia in South Pacific. E. H. Kelley.—p. 63.
Outbreak of Shigella Newcastle Dysentery. V. G. Rubenstein and R. L. Phillips.—p. 64.
*Dermatitis of the Feet and Hands Due to Rubber. C. R. Anderson.—p. 65.
Diabetic Coma. H. Stephens and H. I. Burtess.—p. 66.
California Industrial Accident Fee Schedule. H. F. Peart.—p. 67.
National Medical Legislation. D. H. Murray.—p. 68.
Contagiousness of Scarlet Fever. H. O. Swartout and W. P. Frank.—p. 72.
Emergency Maternity and Infant Care (E. M. I. C.) Program. W. B. Thompson.—p. 72.
Kenny Treatment in Poliomyelitis: Evaluation. J. W. McFarland.—p. 76.

Dermatitis of Feet and Hands Due to Rubber.—Rubber dermatitis of the feet most often affects women, as rubber is used extensively in the manufacture of women's shoes. Rubber cement is used for basting the shoes during the sewing process and for fastening down the sock liner to the inner sole. An elastic rubber fabric is used frequently as an inner lining. The dermatitis may be manifested by erythema, edema, vesiculation, weeping and crusting. It may involve any part of the foot. However, it most frequently appears first on the toes. The sides of the heels are also early sites. Rubber dermatitis of the feet should be suspected when the patient has had a previous dermatitis from rubber girdles, dress shields and garters. There may be confusion with acute dermatophytosis of the feet. Physicians suffering from an eczematous dermatitis of the hands and feet are occasionally subjected to futile treatment for dermatophytosis when actually suffering from surgical glove dermatitis and rubber dermatitis of the feet. Sensitivity to rubber gloves should not be ruled out until patch tests have been performed on the back of the hands. The treatment requires elimination of exposure to rubber, which may prove difficult and, especially in women, may necessitate the purchase of custom built shoes in which all rubber has been eliminated.

Canadian Journal of Public Health, Toronto

35:297-336 (Aug.) 1944

- Experiences in Diphtheria Control in Northern British Columbia. R. C. Knipe.—p. 297.
*Streptococcal Epidemic in Children's Surgical Ward. M. Elizabeth Doyle and Elizabeth Chant Robertson.—p. 302.
*Trial of Dysentery Toxoid (Shiga) in Human Volunteers. L. Farrell, D. T. Fraser and Helen Ferguson.—p. 311.
Health Officer and Cyanide Fumigation. D. V. Currey.—p. 317.
Population Estimates in Wartime. A. B. Valois.—p. 321.

Streptococcal Epidemic in Children's Surgical Ward.

—An epidemic of streptococcal infections in a surgical ward of a children's hospital provided material for study by Doyle and Chant Robertson. The ward admitted surgical patients from 2 to 5 years of age. The ward was overcrowded at the time of the epidemic. Most of the beds were separated only by a small table 20 inches wide, and the children could exchange toys with ease. Close contact of patients due to overcrowding of the ward, the presence of infected attendants, inadequate washing facilities and the presence of hemolytic streptococci in the air were the important factors. The epidemic was checked by removing all those with positive throat cultures, closing the ward to admissions and visitors, using flannel masks and separate gowns in attending each patient, spacing the beds 9 feet apart, providing adequate washing facilities for the personnel, using a reliable hand antiseptic and wet mopping the floor instead of sweeping. A negative Dick test did not indicate immunity to scarlet fever caused by this strain of hemolytic streptococci. The advantage of a more rapid method of typing hemolytic streptococci became evident during the course of this investigation.

Trial of Dysentery Toxoid (Shiga) in Human Volunteers.—In a previous report Farrell and his associates presented laboratory and clinical data which suggested that the experimental product dysentery toxoid (Shiga) was antigenic and

safe for human use and would afford a reasonable hope of protection against dysentery caused by *Bacterium shigae*. The present report describes the reactions of 142 persons who received 1 to 4 doses of 0.25 or 0.5 cc. of the toxoid at various intervals, or a total of 377 injections, and sets forth the results of titration of antitoxin in 215 samples of blood taken from 100 persons at different stages in the process of immunization. Three groups of persons received 3 injections at intervals of ten, twenty-one and forty days respectively, and the ten day group received a recall dose three months after the third dose. The reactions to the injections, both local and systemic, were of the same order as those to the combined antigen T. A. B. T. Provided due caution is observed in the proper testing of the toxoid in laboratory animals, it would appear that a field trial of this material could be undertaken without undue concern. The antitoxic response was strikingly better after 3 doses than after 2. Long intervals between doses were advantageous, but the differences were not great.

Delaware State Medical Journal, Wilmington

16:105-118 (July) 1944

Surgery of Gallbladder and Common Bile Duct. G. S. Serino.—p. 105.

16:119-144 (Aug.) 1944

- Morbidity and Population Trends. E. Cameron.—p. 119.
High School X-Ray Survey. L. D. Phillips, A. M. Dietrich and G. T. Evans.—p. 120.
Postwar Planning in Public Health Field. R. C. Beckett.—p. 122.
Survey of Birth Registration. C. A. Marshall.—p. 125.
War Wives and GI Babies. C. P. Knight.—p. 126.
*Mortality and Prevalence of Heart Disease in School Children of Delaware. J. W. Williams, M. Dressler and R. S. Snow.—p. 129.
Operational Shortcomings of Division of Communicable Disease Control. J. W. Williams and A. R. Cameron.—p. 131.
Important Factors in Control of Syphilis. A. R. Cameron and J. W. Williams.—p. 133.
Laboratory Comments Re Syphilis. R. D. Herdman.—p. 135.
What County Health Unit Means to Doctor and His Community. Katharine B. Franklin.—p. 137.
Newer Knowledge of Nutrition in Pregnancy. Eleanor M. Wilkins.—p. 139.
Public Health Nursing in Prevention and Control of Tuberculosis. Alberta B. Wilson.—p. 141.
Role of Medical Social Worker in Delaware State Board of Health. Eunice Usher.—p. 142.

Heart Disease in School Children.—According to Williams and his collaborators, heart disease ranks high as a cause of death among children over the age of 5 years. In the national figures for the year 1939 heart disease was second to accidents as a cause of death in the age group 10 to 14 years. The figures for the state of Delaware indicate the same tendency. For the entire age span from 5 to 19 years heart disorders caused more deaths than any other condition except accidents. Examination of the hearts of 2,990 children of Kent and Sussex counties in Delaware disclosed 22 children with clinical evidence of organic heart disease, a prevalence rate of 0.7 per cent. Of this group of 22 there were 9 with murmurs characteristic of congenital heart disease and 13 with evidence of rheumatic heart disease. The latter condition was fairly evenly distributed between the children of the elementary and high schools but was somewhat more frequent in the Negro than in the white children. Arrhythmias consisting of 6 cases of extrasystoles and 1 of bradycardia were discovered. A group of 59 additional children had slightly abnormal cardiac sounds which were designated as accidental murmurs. The survey suggested the need for a program for the supervision and care of these children with heart disease. Such a program would include the following activities: 1. Case finding, with reports from physicians of cases of heart disease or rheumatic fever. 2. A central file of the records of these children. Such a file has already been started for records of children found in school surveys. 3. A consultation service with a thorough examination of children suspected of having heart disease. 4. Adequate care of acutely ill children to include beds for those requiring prolonged convalescent care. 5. Broad educational programs for instruction of nurses, physicians and the public in the problems of heart disease, the dangers of rheumatic fever and the methods of care.

Journal of Immunology, Baltimore

49:71-128 (Aug.) 1944

- New Salmonella Type Salmonella Claibornei. K S. Wilcox and Elizabeth K Lennox—p 71
- Hemagglutination by Products of Influenzal Virus Using Infected Mouse Lung and Chick Embryo as Source of Virus. E. Twyble and H. C. Mason—p 73
- Simplified Procedure for Titrating Hemagglutinating Capacity of Influenza Virus and Corresponding Antibody. J E Salk—p 87.
- Immunochemistry of Allergens VI Anaphylactogenic Properties of Proteic Component of Kapok Seed and Relationship of Kapok Seed Antigens to Cottonseed Antigens. E J Coulson, J. R Spies and H Stevens—p 99
- Attempts to Obtain Specific Agglutination of Mixtures of Colloidal Particles or Bacterial Cells with Virus and Antiviral Serum. H E Pearson—p 117
- *Inactivation of Influenza Virus by Mild Antiseptics. W. B Dunham and W J. MacNeal—p 123

Inactivation of Influenza Virus by Mild Antiseptics.

—Dunham and MacNeal reported studies on the action of bactericidal agents on the vaccinia virus. The tests were performed by injecting mixtures of the viral suspension and antiseptics into embryonated eggs. A similar technic, with modifications, was employed in the present study on the influenza virus. A number of antiseptics were tested for their inactivating effect on the virus of influenza during a brief period of exposure. This was accomplished by preparing mixtures of the antiseptics and virus, allowing them to remain in contact for three minutes, diluting the mixtures to the point where they would not be toxic for chick embryos and then injecting the material into embryonated eggs. Survival of the embryos indicated inactivation of the virus. The following preparations were found to inactivate the virus in three minutes or less: phenol, 3 per cent; tincture of iodine, U. S. P. XII, 0.1 per cent; Lugol's solution, U. S. P. XII, 1 per cent; mercury bichloride, 1:1,000; potassium permanganate, 1:1,000; copper sulfate, 1 per cent; propylene glycol, 90 per cent; liquor antisepticus, N. F. VII, 80 per cent.

Journal of Infectious Diseases, Chicago

75:1-102 (July-Aug.) 1944. Partial Index

- Effect of Immunity on Asexual Reproduction of Plasmodium Brasiliense. W. H. Tallaferro and Lucy Graves Tallaferro—p 1.
- Study of Defense Mechanism Involved in Hereditary Resistance to Pullorum Disease of Domestic Poultry. J M. Severens, E Roberts and L E Card—p 33
- Carbohydrate Lipid Fraction of Gonococcus and Meningococcus. A. K. Boor and C P. Miller—p 47.
- Studies on Transmission of Hemolytic Streptococcus Infections. M. Hamburger Jr—p 58
- Cultivation of Human Tubercle Bacilli on Egg Mediums. Dorothy M. Powlson and Janet R McCarter—p 95.

Journal of Nervous and Mental Diseases, New York

100:115-228 (Aug) 1944

- Bruns Syndrome. B. J Alpers and H E Yaskin—p 115.
- Cerebellar Type of Ataxia Associated with Cerebral Signs. A J. Aruff and L A Kaplan—p 135
- Current Views on Neuropsychiatric Effects of Barbiturates and Bromides. F. J. Curran—p 142
- Psychiatric Aspects of Epilepsy. E Davidoff, G. M. Doolittle and V I Bonifede—p 170.
- *Subarachnoid Administration of Pyridoxine Hydrochloride in Diseases of Nervous System (Preliminary Report). S Stone—p 185

Pyridoxine Hydrochloride in Diseases of Nervous System.—Stone administered pyridoxine hydrochloride intraspinally to 26 patients with various disturbances of the nervous system. The average dose was 30 mg for children and 50 mg. for adults, with one to four injections per patient. It was well tolerated by all of these patients, and no untoward reactions were observed following its use. In a case of Sydenham's chorea of long standing, complete disappearance of choreic movements followed three injections of 50 mg. of pyridoxine at weekly intervals. In 2 other cases great improvement was observed following administration of a single dose of 50 mg. In 2 cases of infectious meningomyelitis and 1 case of anterior poliomyelitis, relaxation of muscular rigidity, some improvement in muscle strength and increase in range of passive and active movements became apparent within twenty-four hours after intraspinal administration of 50 mg. of pyridoxine. It hastened

recovery in a case of Korsakoff's disease which failed to respond to prolonged intramuscular and oral vitamin therapy. It also produced disappearance of pain and limitation of leg extension in a case of sciatic neuritis of unknown etiology after two intraspinal injections of 50 mg. at a weekly interval. Reduction of spasticity, improvement in gait and decrease of hyperreflexia were observed in a case of multiple sclerosis and a case of spastic paraplegia of unknown etiology following a single injection of 50 mg. In cases of dementia paralytica and the tabetic form of dementia paralytica the improvement was manifested in increased alertness, improvement in the sense of well-being, better coordination and improved ward behavior. Pyridoxine appeared to be of value when combined with intraspinal thiamine hydrochloride and artificial fever therapy. The favorable results observed in this small group of cases would seem to indicate that pyridoxine hydrochloride when administered intraspinally is an important adjunct in the treatment of postinfectious states and degenerative diseases of the nervous system, either when used alone or in combination with other vitamins or other methods of treatment.

Journal of Nutrition, Philadelphia

28:71-140 (Aug.) 1944

- Effects of Glucose, Fructose and Galactose on Respiratory Exchange of Goat. E G Ritzman and T M Carpenter—p 71.
- Role of Dietary Fat and Linoleic Acid in Lactation of Rat. J. K Loo-ii, J. F. Lingemelter, J W. Thomas and L. A Maynard—p 81.
- Vitamin C Level of Blood Plasma in Guinea Pigs. L. Karel and C. W. Chapman—p 89
- Further Studies on Vitamin C Metabolism of Preschool Children. Frieda L. Meyer and Milicent L Hathaway—p 93.
- Nutritive Value of Canned Foods: I. Introduction and Sampling Procedure. L E Clifton—p 101.
- Id. II. Ascorbic Acid and Carotene or Vitamin A Content. Anne Pressley, Clara Ridder, M. C Smith and Emily Caldwell—p 107.
- Id. III. Thiamine and Nicotin. Margaret Ives, J. R. Wagner, C. A Elvehjem and F. M Strong—p 117.
- Id. Riboflavin and Pantothenic Acid. Mary Louise Thompson, Elizabeth Cunningham and Esmond E Snell—p 123.
- Id. Distribution of Water Soluble Vitamins Between Solid and Liquid Portions of Canned Vegetables and Fruits. Miriam K. Brush, Winifred I. Hinman and Evelyn G. Halliday—p 131.

Journal of Pediatrics, St. Louis

25:105-190 (Aug.) 1944

- Stomatitis and Diarrhea of Infants Caused by Hitherto Unrecognized Virus. G. J. Buddingh and Katharine Dodd—p 105.
- *Treatment of Influenzal Meningitis with Sulfadiazine: Further Report. W. Sako, C A Stewart and J. Fleet—p 114
- Experiences with Convenient Method for Culturing Stools. J. Fleet and C A Stewart—p 127.
- *Treatment of Hyperthyroidism in Children. C. B McIntosh—p 133.
- Eruption of Deciduous Teeth. H C. Sandler—p 140
- Treatment of Vascular Nevus. C R Anderson—p 148
- Cor Biloculare. Report of Case. F. R Shechter and D R Meranze—p 150
- Lymphoblastoma in Children Under 13 Years of Age. I. I Kaplan—p 155
- Osteogenesis Imperfecta and Osteopsathyrosis. Contribution to Study of Their Identity and Their Pathogenesis. S Rosenbrum—p 161
- Examination of Development of Certain Adaptive Behavior Patterns in Infants. Sarah S Morgan and J J B Morgan—p 168

Sulfadiazine in Influenzal Meningitis.—Sako and his associates report that 16 of 23 children with influenzal meningitis given sulfadiazine have been discharged as cured and have remained well. One patient developed and still has a residual generalized spasticity. Six fatalities occurred, all in infants below 8 months of age. There was only 1 recovery in the group of infants under 8 months of age. No fatalities occurred above the age of 8 months. Since sulfadiazine alone does not seem sufficient for young infants, it is imperative that type specific rabbit antiserum be given together with large doses of sulfadiazine. In older infants and children the recovery rate is high with sulfadiazine alone. Few spinal punctures and drainages were performed. Leukopenia in 1 patient, hematuria in 1 and drug fever in 1 were the only toxic conditions encountered that can be attributed to the drug.

Treatment of Hyperthyroidism in Children.—Recent controversy regarding the treatment of toxic diffuse goiter in children induced McIntosh to review the records of the children with the disease who were treated at the University Hospital

of Iowa City between 1925 and 1943. All of the 23 children were girls ranging in age between 7 and 16 years. Nineteen of the patients were subjected to subtotal thyroidectomy and 4 were treated without surgery. In the group of children operated on were 9 complete arrests, 3 nearly complete arrests, 5 recurrences and 2 deaths. The patients not operated on were all successfully treated by conservative management. The medical management of the 4 patients was not the same in all cases. All of them received bed rest during the period of hospitalization. Each also received phenobarbital sedation, the dose being regulated symptomatically. A high caloric and high carbohydrate diet was insisted on in each case. Lugol's solution was given to 3 children. The other child received no iodine therapy. Roentgen therapy was used in 2 instances after medical treatment alone appeared to be inadequate. The average period of time for the treatment of the patients operated on was six weeks, while that of those not operated on was seven months. Children deserve an adequate trial of medical management before surgery is advised, and for a considerable number of them surgery is neither necessary nor desirable.

Journal Pharmacology & Exper. Therap., Baltimore

81:209-306 (July) 1944

- Local Nervous Tissue Changes Following Spinal Anesthesia in Experimental Animals. Co Tui, A. L. Preiss, I. Barcham and M. I. Nevin. p. 209.
- Distribution Method for Differentiation of Urinary Excretion Products of Sulfonamide Drugs and Role of These Products in Urolithiasis. J. V. Scudi and Viola C. Jelinek. p. 218.
- Toxicity and Trypanocidal Activity of Some Organic Antimonials. L. G. Goodwin. p. 224.
- Contribution to Pharmacology of Aliphatic Amines. R. P. Ahlquist. p. 235.
- Studies on Shock Induced by Hemorrhage: VIII. Inactivation of Apoenzyme of Amino Acid Oxidase and Lactic Dehydrogenase in Anoxia. Margaret E. Greig. p. 240.
- Bone Marrow Procedure for Assay of Liver Extracts for Anti-Pernicious Anemia Activity. C. M. Young and H. D. Bett. p. 248.
- Toxicologic and Pharmacologic Investigation of Sodium Sec-Butyl Ethyl Barbituric Acid (Butisol Sodium). C. M. Gruber, F. W. Ellis and G. Freedman. p. 254.
- Clinical Actions of Ethynorsuprenin. M. L. Tainter, W. M. Cameron, L. J. Whitsett and M. M. Hartman. p. 269.
- Toxicity and Trypanocidal Activity of p-Sulfonamidophenylarsonic Acid and Certain of Its Derivatives. E. L. Way and L. K. Chan. p. 278.
- Acute Toxicity for Mice of "Mapharsen" and Sodium Sulfathiazole Administered Separately and in Combination. Elizabeth M. Cranston, W. G. Clark and E. A. Strakosch. p. 284.
- Relation of Intensity of Morphine Abstinence Syndrome to Dosage. H. L. Andrews and C. K. Himmelsbach. p. 288.
- Inhibition of Nervous Transmission in Synapses and End Plates by Thiamine. K. Unna and E. P. Pick. p. 294.
- Sulfamerazine (2-Sulfanilamido-4-Methylpyrimidine): III. Comparative Activity of Sulfamerazine, Sulfadiazine and Sulfapyridine in Production of Hemolytic Anemia in Mouse. A. R. Latven and A. D. Welch. p. 301.

Medical Annals of District of Columbia, Washington

13:285-318 (Aug.) 1944

- *Relationship of German Measles During Pregnancy to Congenital Ocular Defects. B. Rones. p. 285.
- Modern Approach to Divorce Evil. J. R. Ernst. p. 288.
- Prevention of Pulmonary Embolism. L. B. Rose. p. 291.
- Prognosis of Spontaneous Subarachnoid Hemorrhage. H. J. Forrest. p. 294.

German Measles During Pregnancy and Congenital Ocular Defects.—Rones presents histories of 4 infants whose ocular defects lend support to the claims of Australian observers that exanthematous disease in the mother during the early months of pregnancy can result in congenital ocular abnormalities in the child. Three of the mothers had had rubella and 1 had had morbilli. In the 2 cases in which the exanthem occurred during the second month of pregnancy the infants had cataracts, while in the 2 with the disturbance in the third month congenital glaucoma was present. Not all cases of congenital ocular abnormalities are due to an exanthematous disease in the mother during pregnancy. Many other factors can operate to produce such disturbances. More cases will have to be compiled before the occurrence of exanthems in the mother and ocular defects in the infants are accepted as causally related rather than coincidental. Rubella has been regarded as one of the most innocuous of the exanthematous diseases. We are now

faced with the fact that the virus attacking a pregnant woman before the placental barrier has been developed can cause a disturbance to the developing fetus, and particularly to the optic buds.

Military Surgeon, Washington, D. C.

95:89-178 (Aug.) 1944. Partial Index

- *Pemmican. V. Stefansson. p. 89.
- Physiologic Effects of High Temperatures. W. Machle. p. 98.
- Caring for the Eyes of Britain's Army. S. Duke-Elder. p. 105.
- Red Cross Services in Evacuation Hospital. L. H. Berman. p. 107.
- Veterinary Service at Army Post. D. M. Campbell. p. 110.
- Some Aspects of Venereal Disease Control in Army. C. S. Hendricks and J. D. Winebrenner. p. 121.
- Report of Case of Peripheral Neuritis with Hypertension Following Serum Therapy. H. F. Robertson and F. Varmus. p. 129.
- Meningococcal Meningitis. H. F. Wechsler and A. H. Rosenblum. p. 132.
- Complete Rupture of Tendo Achillis. M. G. Henry. p. 135.
- Secondary Repair of Rupture of Posterior Urethra with Case Report. S. Gersten. p. 139.
- Oral Aspect of Cleidocranial Dysostosis. W. S. Britt. p. 143.
- Management of Dermatophytosis. J. S. Snow. p. 147.
- Practical Walking Cast for Use Under Wartime Conditions. D. Goldberg. p. 151.
- Short PR Interval with Prolonged QRS Complex Associated with Paroxysmal Tachycardia. L. F. Bishop Jr. and R. W. Kimbro. p. 153.

Pemmican.—Stefansson reviews the history of dried meats and of pemmican in particular. To make pemmican the Indian removed every trace of fat, split the lean into thin sheets and hung it up for wind drying. When thoroughly dry, the lean was converted into pounded meat. Bags were made of the hide of the animal in question (buffalo hide for buffalo meat, caribou for caribou meat and so on). These pillow size rawhide bags were filled loosely with pounded meat. Suet was then poured into the bag so as to percolate everywhere. The mouth was sewed up before the fat had time to harden completely and the bag tramped on or otherwise pressed so as to become flat, with a usual thickness of 6 or 7 inches. Pemmican seems to have kept as well in Oklahoma as in Manitoba. There are records of ten, twenty and more years in perfect condition. The author thinks that if our army used pemmican we could reduce by a third or half the weight and bulk of the meat element in a combination ration; with its nearly or quite exclusive use for certain purposes, we could reduce by a third or half the total weight and bulk of present special emergency or survival rations—such, for instance, as Army ration K, and we would have, from the start, a food which, in heat or cold, in moist or dry, is not experimental; an ancient Indian food that has been proved out by thousands of white users.

New England Journal of Medicine, Boston

231:71-110 (July 20) 1944

- Toxic Factor in Experimental Traumatic Shock. J. C. Aug. p. 71.
- Renal Failure Simulating Adrenocortical Insufficiency. G. W. Thorn, G. F. Koepf and M. Clinton Jr. p. 76.
- Problem of Tuberculosis Control. J. A. Foley and J. B. Andosca. p. 86.
- Pigmentation of Skin. H. Jeghers. p. 88.

231:111-168 (July 27) 1944

- Infectious Mononucleosis Simulating Brucellosis. A. D. Rubenstein and Carolyn I. Shaw. p. 111.
- *Primary Suture of Simple Mastoid Wounds. L. F. Johnson and P. S. Spence Jr. p. 116.
- Cavernous Sinus Thrombophlebitis: Report of Case with Multiple Cerebral Infarcts and Necrosis of Pituitary Body. A. D. Weisman. p. 118.
- Pigmentation of Skin (continued). H. Jeghers. p. 122.

Primary Suture of Simple Mastoid Wounds.—Johnson and Spence report their experience in 44 cases of acute mastoiditis in which treatment was primary closure of the wound after the cavity had been filled with sulfonamide powder. The technical demands for primary suture are exacting. The mastoid exenteration must be complete. Great care should be taken to remove all infected cells. The perilabyrinthian cells are removed until the horizontal semicircular canal is sharply defined. The zygomatic area is thoroughly cleaned out, and in a number of cases the incus is brought into view. The mastoid cavity is then irrigated with isotonic solution of sodium chloride followed by thorough drying of the cavity. If any bleeding persists, epinephrine packs may be used to establish complete hemostasis.

The cavity is then filled with sulfonamide powder. It appears to make little difference in the end result which sulfonamide drug is employed. In more than half of the cases thus treated the mastoiditis complicated scarlet fever. In these it was possible to reduce the period of hospitalization from an average of fifty-two days to twenty-seven days. Patients without scarlet fever went home with dry ears, and the postaural wound healed in an average of fifteen days. At first patients were kept in the hospital longer than absolutely necessary in order to observe the effects of primary suture. Those admitted later were allowed to go home in fewer days. No serious complications were seen in primary closure, even in cases in which the sinus or dura was exposed. The temperatures promptly returned to normal after every operation, and no intracranial complications were noted.

231:169-218 (Aug. 3) 1944

- *Tularemia in New England: Review of 18 Cases, with Report of 2 Additional Cases. F. D. Moore, C. S. Sawyer and S. G. Blount Jr.—p. 169.
Vitamin B Deficiency in Private Practice. D. Merrill.—p. 174.
Purpose and Accomplishments of Lawrence Clinic. H. F. McCarthy and F. C. Atkinson.—p. 179.
Pigmentation of Skin (concluded). H. Jeghers.—p. 181.

231:219-248 (Aug. 10) 1944

- Prelude to Ether Anesthesia. W. W. Ford.—p. 219.
Aids to Visual Education in Medicine. F. R. Harding.—p. 224.
Multiple Extragenital Giant Chancres: Report of Case. W. F. Lever.—p. 227.
Neurology. H. H. Merritt.—p. 230.

231:249-278 (Aug. 17) 1944

- Delirium Tremens. C. B. Chapman.—p. 249.
War and Public Health. F. F. Russell.—p. 255.
Echinococcal Disease: Report of 2 Cases. T. W. Worthen and J. F. Jenovese.—p. 260.
Recent Advances in Surgery. A. Blalock.—p. 261.

Tularemia in New England.—Moore and his associates point out that New England appears to have been the last region in the United States to remain free of infection with *Pasteurella tularensis*, but now a total of 20 cases can be brought together. A chronological review of the New England cases is presented and 2 new cases are reported in detail. The first of these occurred in Massachusetts. A man aged 52 who had been bitten by an unidentified insect after three days began to notice occasional chilly sensations, fever and muscular weakness. Following a week of such symptoms he noticed soreness in the left axilla and a small papule at the site of the bite, which broke down and formed an ulcer. He poulticed the lesion and called in his physician, who gave him sulfadiazine for ten days. Since the fever and malaise persisted, as well as the ulcer and the sore node in the left axilla, he was referred to a hospital. Tularemia was suggested as a tentative diagnosis. A blood culture yielded no growth, and serum agglutination tests against *Pasteurella tularensis* were negative in all dilutions. The clinical course was one of continued swinging fever. A node developed in the right axilla and then generalized lymphadenopathy appeared. To obtain material to clarify the diagnosis, the ulcer was excised. The operative site healed cleanly, and the palpable nodes disappeared. Repeated agglutination tests for *Past. tularensis* were positive and the disease was now diagnosed as the ulceroglandular form of tularemia. The second patient, a man aged 36 from Rhode Island, four days prior to the onset of his illness had been hunting rabbits and had skinned and dressed them himself. He had a hangnail on the left thumb, and one day after the onset of the systemic illness the thumbnail became infected and the inflammation persisted despite treatment. For the eleven days until entry to the hospital this fever continued rising to 102 or 103 F. daily. Febrile illness with malaise, headache, cough and the infected thumb and axillary nodes continued. A diagnosis of ulceroglandular tularemia was made, and the possibility of pneumonic involvement was raised. Agglutination tests were positive against *Past. tularensis* in dilutions up to 1:80. Both of these patients recovered, but 3 of the 20 cases reported in New England have been fatal. The response of the Massachusetts patient to primary excision of the ulcer was striking, and if the results of this method are corroborated by other observers it may constitute a useful way of shortening the period of disability from the disease.

New Orleans Medical and Surgical Journal**97:1-42 (July) 1944**

- Evolution of Tuberculosis in Human Lung. C. A. Stewart.—p. 1.
Thirty-Five Millimeter Fluorography in Mass Chest X-Ray Surveys. R. A. Brown.—p. 4.
Permanent Presence of Specific Immunizing Antibodies in Blood of Yellow Fever Subjects: Experimentally Demonstrated by "Mouse Protection Test" Seventy-Seven Years After a Clinically Recognized Attack of Disease. R. Matas.—p. 9.
Mikler's Nodule. M. T. Green.—p. 13.
Production and Treatment of Scars and Keloids. W. Marshall.—p. 15.
Food: Facts and Fads. P. R. Cannon.—p. 17.
Arthropod Borne Encephalites of North America. J. L. Henderson.—p. 22.

97:43-92 (Aug.) 1944

- Some Postwar Problems in Medical Education. L. H. Weed.—p. 43.
Diagnosis of Disease Without Instruments of Precision. R. H. Major.—p. 49.
Clinical Evaluation of Intradermal Test for Poliomyelitis. C. Ramirez.—p. 58.
Pneumoperitoneum in Treatment of Pulmonary Tuberculosis: Report of Patient Successfully Treated. B. M. Stuart, R. L. Pullen and J. L. Wilson.—p. 61.
Physiologic and Clinical Phenomena of Aging. E. P. Boas.—p. 64.
Blood Supply of Sternum: I. X-Ray Studies of Injected Sternum Showing Venous Return. P. Pizzolato.—p. 71.

New York State Journal of Medicine, New York**44:1615-1726 (Aug. 1) 1944**

- Clinical Experience with Penicillin. D. G. Anderson.—p. 1651.
Otolaryngologic Problems of Aviation. P. Northington.—p. 1655.
Dermatologic Diseases Frequently Encountered by Otolaryngologists. A. B. Cannon.—p. 1661.
Reinforcement of Sulfonamide Activity: Experimental and Clinical Observations. E. R. Neter.—p. 1669.
Results of Cancer Treatment. C. E. Farr.—p. 1673.
Ophthalmoscopic Signs of Terminal Hypertension. A. J. Bedell.—p. 1675.
Pentothal Sodium Anesthesia in Shock and Hemorrhage. C. K. Elder.—p. 1679.

44:1727-1838 (Aug. 15) 1944

- Management of War Amputations in General Hospital. R. H. Alldredge.—p. 1763.
*Report of 85 Fenestration Operations for Otosclerosis. J. M. Smith.—p. 1771.
Fluorescence with Wood Filter as Aid in Dermatologic Diagnosis: Observation on Patients at Bellevue Hospital. M. J. Costello and L. V. Luttenberger.—p. 1778.
Evaluation of Various Methods of Treatment of Chronic Cervicitis. M. N. Hyams.—p. 1785.
Goals and Objectives in Psychotherapy. L. R. Wolberg.—p. 1792.
Common Cold. H. Adler.—p. 1797.
Correlation of Peritoneoscopic Findings with Clinical and Pathologic Factors, Especially of Liver. L. P. Wershub.—p. 1803.
Basic Concepts of Alcoholics Anonymous. W. G. Wilson.—p. 1805.

Fenestration Operations for Otosclerosis.—In a previous report Smith reported 32 cases of fenestration operation. About one third of these were successful. The results have greatly improved in the 53 additional operations reviewed in this article. The improvement in the results dates back to the new location of the fistula. In the first 18 operations of the total of 85 the fistula was made over the length of the external semicircular canal posterior to the amputated end, with the head of the malleus removed and the incus in its normal position. In the rest of the series, 67 in number, the fistula was moved forward over the dome of the vestibule anterior to the amputated end of the horizontal semicircular canal, with the head of the malleus and the incus removed. The results immediately were better. The fact requiring special emphasis is that in a vast majority of the cases of otosclerosis there is a gradual loss of hearing extending over a considerable time before there is a serious impairment of nerve function. It is during this stage that the operation offers the best chance for a successful and lasting result. If allowed to continue uninterrupted, the loss of nerve function will reach a point where the patient cannot be helped by the operation. The author performed the fenestration operation on 6 patients with severe loss in air and bone conduction. These patients submitted to the operation after being told the poor prospects. There were no successful results in these patients. The fact that there were no complications or deaths in the 85 reported cases prove that it may be performed without undue risk to the patient. It is dangerous in the hands of the untrained technician. The operation must first be taught on the cadaver, and the necessary time and effort

must be devoted to the correlation of the intricate steps comprising its technic before it is attempted on the living. The successful fenestration operation not only restores practical hearing but also checks the progress of otosclerosis.

Ohio State Medical Journal, Columbus

40:709-804 (Aug.) 1944

- *Outbreak of Typhoid Fever Attributed to Baked Beans Contaminated by Chronic Typhoid Carrier. E. E. Kleinschmidt.—p. 725.
Benign Pulmonary Changes in Arc Welders: Arc Welders' Siderosis. J. A. Groh.—p. 732.
Ménière's Syndrome. J. A. Rudolph.—p. 736.
Radiation Therapy as Method of Treatment in Nonmalignant Conditions. L. M. Platt.—p. 738.
Operability versus Curability of Cancer of Breast. U. V. Portmann.—p. 742.
Chordotomy. E. W. Shannon.—p. 746.
Ruptured Saccular Aneurysm of Circle of Willis in Patient Cured of Gastric Carcinoma. T. C. Laipply.—p. 750.

Typhoid Outbreak Attributed to Contaminated Baked Beans.—Kleinschmidt describes an outbreak of typhoid resulting in 60 known cases in Toledo, Ohio, and 21 others in three counties in southern Michigan occurring in the months of June and July 1943. Epidemiologic investigation revealed the outbreak to be due to the eating of baked beans contaminated by a single chronic typhoid carrier living in Toledo. This outbreak established a new route of spread for typhoid and directed attention to the need for more careful health supervision of wholesale food establishments, especially those engaged in dispensing prepared foods. It emphasizes the necessity for continued effort to control typhoid carriers and illustrates the explosive potentialities of outbreaks of this disease despite a downward trend in its incidence and a condition of apparent safety, as might be inferred from current statistical observations.

Physiological Reviews, Baltimore

24:297-408 (July) 1944

- Anticoagulants Effective in Vivo, with Special Reference to Heparin and Dicumaryl. A. J. Quick.—p. 297.
Hyperpnea of Muscular Exercise. J. H. Comroe, Jr.—p. 319.
Lactation. W. E. Petersen.—p. 340.
Maintenance of Nitrogen Balance by Intravenous Administration of Plasma Proteins and Protein Hydrolysates. R. Elman.—p. 372.
Functional Organization of Cerebral Cortex. W. S. McCulloch.—p. 390.

Public Health Reports, Washington, D. C.

59:1041-1076 (Aug. 11) 1944

- Simplified Procedure for Detecting Cross Reactions in Diagnostic Antipneumococcus Serum. Bernice E. Eddy.—p. 1041.
X-Ray Exposure in Manufacture and Operation of Certain Electronic Tubes. A. F. Bush, H. T. Castberg and D. G. Macpherson.—p. 1045.

59:1077-1102 (Aug. 18) 1944

- Studies on Duration of Disabling Sickness: V. Frequency of Short Term Absences and Its Relation to Total Frequency. W. M. Gafafer and Rosedith Sitgreaves.—p. 1077.
Pathologic Changes in Animals Exposed to Commercial Chlorinated Diphenyl. J. W. Miller.—p. 1085.

59:1103-1130 (Aug. 25) 1944

- *Methods of Sanitizing Eating and Drinking Utensils. J. Andrews.—p. 1103.

Methods of Sanitizing Eating and Drinking Utensils.

—Andrews reports the results of a comprehensive survey of eating and drinking establishments made in an Eastern city. Bacterial counts were made of plates, tumblers, spoons, forks and beer glasses. The lowest count reported, 2,800, was on spoons at eight soda fountains. The highest count, 7,000,000, was on beer glasses at nineteen barrooms. The next to the highest count, 390,000, was on tumblers at the eight soda fountains. Each figure is the average "swab count" of ten utensils. Rabbit blood agar was used for plating. These counts, all of which are greatly in excess of the standard of 100 organisms per utensil surface, show the need for improvement in dishwasher practice. On the average, lower bacterial counts were obtained with machine washing than with hand methods. However, the data do not justify the conclusion that manual methods should universally be discarded in favor of dishwashing machines. Satisfactory results can be obtained by either method. During the rush hour dishes will frequently be put

through the machine too rapidly to give proper washing and rinsing. Observations at one large cafeteria during the noon rush showed that for a group of ten consecutive racks of dishes washed one rack was in the machine for only twenty seconds, four for thirty seconds, three for forty-five seconds and two for sixty seconds. The shorter exposures are inadequate. One solution of this problem is to encourage the restaurant to have in use a large enough supply of utensils to tide over the rush period without having to make the dishwashing operation only a pretense. Frequently the person doing the dishwashing has not been instructed in the proper dishwashing technic and has not been impressed with the importance of his job. Since the outbreak of war, the problem of maintaining good sanitation in restaurants has been intensified by shortages of manpower and materials and increased customer loads. There are indications that the amount of disease spread in restaurants is increasing.

Radiology, Syracuse, N. Y.

43:107-212 (Aug.) 1944

- Correlation of X-Ray Diagnosis with Operative Findings in Small Intestinal Obstruction. C. J. Hunt.—p. 107.
Roentgenologic Features of Mediastinal Tumors. L. L. Robbins.—p. 115.
*Statistical Analysis of 100,000 Examinations of Chest by Photoroentgen Method. P. Zanca and F. K. Herpel.—p. 122.
Further Experiences with Venography. E. C. Baker and F. A. Miller.—p. 129.
Anteroposterior Lordotic Projection in Roentgenographic Examination of Lungs. G. Lavner and B. Copleman.—p. 135.
Neurosurgery and Radiation for Relief of Pain in Advanced Cancer. G. Cooper Jr. and V. W. Archer.—p. 142.
Ureter and Its Involvement in Pelvic Irradiation. E. E. Mansur.—p. 147.
Development of Centralized Radon Services in Australia. C. E. Eddy.—p. 155.
Evolution of Improved Transvaginal Speculum. A. W. Erskine.—p. 170.
Barium-Gelatin Mixture for X-Ray Examination of Digestive Tract. M. S. Abel.—p. 175.

Analysis of 100,000 Examinations of Chest.—Zanca and Herpel present the results of routine examinations of the chest by the photoroentgen method in 100,000 consecutive selectees. Stereoscopic roentgenograms on 4 by 10 inch films have been found highly satisfactory, economical, easy to handle and process, susceptible of being rapidly interpreted with minimum eye strain and fatigue, and superior in definition to 14 by 17 inch films. The rejection rate for pulmonary tuberculosis in this series was 4.91 per thousand examined. This rejection rate applies to all types of pulmonary tuberculosis, from far advanced active cases with cavitation to the chronic minimal fibrous or apparently arrested cases in which stability of the lesions was not yet demonstrated. The low rejection rate for tuberculosis at this station reflects creditably on the splendid antituberculosis program in North Carolina over the last quarter of a century, also on the screening out of known tuberculous selectees at the local boards of origin.

Rocky Mountain Medical Journal, Denver

41:449-528 (July) 1944

- Rocky Mountain Spotted Fever: Diagnosis of Disease. G. E. Baker.—p. 466.
Screw-Worm Fly in Utah. H. L. Marshall and D. T. Jones.—p. 478.
Carcinoid Tumors of Appendix. W. W. King.—p. 480.

41:529-608 (Aug.) 1944

- Perforating Wounds of Abdomen. F. H. Good and J. G. Hedrick.—p. 546.
*Poliomyelitis, 1943, Children's Hospital, Denver, Colo. Lula O. Lubchenco, R. Scandalis, H. D. Palmer and G. Valdemar.—p. 549.
Viscerotropic Syndrome. R. B. Weiler.—p. 555.

Poliomyelitis.—Lubchenco and her associates review observations in 120 cases of poliomyelitis treated during the last six months of 1943 at the Children's Hospital of Denver. All patients with acute and convalescent poliomyelitis were treated by the Kenny method. The technic as described by Kenny could not be followed in regard to frequency of treatments. Ten to twelve packs plus physical therapy every day was impossible except for the most severe cases because of the shortage of help. Hot fomentations were applied four to five times a day to most of the patients. In the very seriously ill with respiratory difficulties, packs were given as often as three to four times every hour. When persistent and severe spasm was

present, ten to twelve packs a day were applied. During the acute stage some patients would wake up during the night and ask for packs, which gave them relief. Physical therapy was started as soon as it could be given without causing pain in the spastic muscles. This consisted of passive exercises to the "alienated" and paralyzed muscles and muscle reeducation of those muscles in which some power was present. Tightness which frequently followed spasm was treated successfully by stretching exercises. Physical therapy was administered three or four times a week. Accurate localization and early evaluation of muscle spasm and weakness is necessary if one is to use the Kenny method effectively. Thirty-two per cent of the patients were discharged as recovered. Of these, 12 per cent had no muscle weakness on admission. An additional 58 per cent showed improvement of varying degree. Ten per cent showed no change. Thirteen patients have had braces applied and 4 more are soon to receive them. Spasm in one or more muscles was present in all the cases. The average duration of spasm ranged from 92 weeks (neck) to 163 weeks (hip adductors). Patients received hot fomentations for an average of fourteen weeks. In 14 of 88 cases deformities developed despite hot pack therapy. The mortality rate was 58 per cent. All of the seven deaths occurred in cases of poliomyelencephalitis. The incidence of bulbar poliomyelitis was highest in those patients who had had operations in the mouth or pharynx. Three severe cases occurred within four weeks after tonsillectomy. One fatal case occurred two weeks after tooth extraction.

South Carolina Medical Assn. Journal, Florence

40:137-158 (July) 1944

- Likelihood of Establishment of Alien Diseases in United States H S Mustard—p. 137
Trends of Immunization in Present Day Pediatrics M W Beach and B O Ravenel—p. 140

40:159-178 (Aug) 1944

- Prevention of Venous Thrombosis and Pulmonary Embolism E A Himes Jr—p. 159
Chemotherapy in Bacterial Infections W H Kelley—p. 164
Use of Sulfonamides in Surgery J McLeod—p. 167.

Surgery, St. Louis

16:169-318 (Aug) 1944

- *Endocrine Treatment of Cancers of Prostate Gland A L Dean Helen Q Woodard and G H Twombly—p. 169
Relationship of Hormones to Testicular Tumors G H Twombly—p. 181
Adrenal Cortical Tumors—Physiologic Considerations A T Kenyon—p. 194
Hormonal Tumors of Adrenal G I Cahill—p. 233
Endocrine Activity of Thyroid Tumors and Influence of Thyroid Hormone on Tumors in General J Lerman—p. 266
Endocrine Aspect of Enlargements of Parathyroid Glands O Cope—p. 273
Hyperinsulinism in Relation to Pancreatic Tumors A O Whipple—p. 289
Endocrinologic Aspects of Tumors of Pituitary Gland L M Davidoff—p. 306

Endocrine Treatment of Cancers of Prostate.—Dean and his associates review observations on 100 patients with cancer of the prostate. These patients were treated either by castration or by the administration of diethylstilbestrol given in doses of 1 to 5 mg daily by mouth. Both forms of treatment have given striking clinical improvement at least temporarily. Pain is abolished, appetite is increased and a gain in weight results. After seven to eight months the patients are apt to have a return of pain and obvious progression of disease to death. Institution of other treatment, diethylstilbestrol for the castrated patients or castration of the patients treated originally with diethylstilbestrol, fails to affect the unfavorable course. Some patients continue to remain clinically free from symptoms of prostatic cancer for two years or longer. The number of such prolonged arrests of cancer seems more frequent in the group treated with diethylstilbestrol than by castration, so that this has become the routine initial form of treatment in the last eighteen months. Diethylstilbestrol seems to cause regression in the size of the prostate and reduction in the amount of residual urine more frequently than castration. Changes in bony metastases are toward an increase in calcification. Elevation of serum acid phosphatase above 1 Bodan's unit is pathognomonic

of prostatic cancer, although a low acid phosphatase does not rule out its presence. Serum acid phosphatase falls promptly in those patients who respond favorably to castration and rises again with a return of cancerous activity. The same changes occur more slowly in patients treated with diethylstilbestrol. Castration decreases estrogenic excretion in the urine and usually causes a rise in androgens as measured colorimetrically as 17-ketosteroids by the Callow-Zimmerman test. It causes a rise in excretion of pituitary gonadotropic hormones in the urine. The administration of diethylstilbestrol decreases the output of the 17-ketosteroids and the gonadotropic hormone from the pituitary. After its administration the excretion of diethylstilbestrol in the urine gives a great rise in the estrogen assays. These findings suggest that the mechanism whereby castration and diethylstilbestrol cause regression of prostatic cancers is fundamentally different.

War Medicine, Chicago

6:1-66 (July) 1944

- Malnutrition During Convalescence Prepared Under Direction of Committee on Convalescence and Rehabilitation of National Research Council—p. 1
Summary of Activities of Procurement and Assignment Service I H Lahey and J L Kaukonen—p. 10
Visual Aids in Preventive Psychiatry R R Cohen—p. 18
Dyspepsia Regimen Method of Rehabilitation A A Goldbloom and H Schildkrout—p. 24
Dimethyl Phthalate as Repellent in Control of Phlebotomus (Pappas or Sandfly) Fever C B Philip J R Paul and A B Sabin—p. 27
Subdural Hygroma Report of 3 Cases W G Haynes—p. 34
Psychiatric Voice Recordings in Military Service Recorded Program A A Rosner—p. 38

Wisconsin Medical Journal, Madison

43:765-900 (Aug) 1944

- Congenital Heart Lesion Pulmonary Stenosis and Interventricular Septal Defect Report of Case M Hardgrove and A J Gramling—p. 793
Recent Advances in Treatment of Meningitis V J Cordes—p. 795
Sequelae of Fractures of Neck of Femur and Their Treatment C C Schneider—p. 799
Hereditary Hemorrhagic Telangiectasia Report of Case with Review of Literature J J Barrock—p. 803

43:901-1000 (Sept) 1944

- Virus Diseases of Man E R Krumholz—p. 927
Caudal Anesthesia H A Cunningham—p. 931
Dilantin Hyperplastic Gingivitis R P Gingras—p. 934
*Refrigeration Amputation J L Neller and E R Schmidt—p. 936
Intra Abdominal Diverticulitis Report of 11 Cases J J Gramling Jr—p. 942
Tuberculosis Picture in Wisconsin A Filek—p. 947

Refrigeration Amputation.—Neller and Schmidt say that refrigeration was first applied at the Wisconsin General Hospital to a patient for whom, because of his extremely poor condition, no other therapy seemed to present a reasonable chance of success. This man, aged 65, entered moribund, with diabetic gangrene of the foot, gross infection, generalized sepsis and uncontrolled diabetic ketosis. The case was judged hopeless. Refrigeration amputation was performed and the result was so favorable that subsequently the authors used the method for 20 additional patients. All of them were poor risks, all had established gangrene, many had gross infection and general sepsis, were diabetic, and the average age was 68 years. The authors stress the importance of the proper selection of patients. Routine use of refrigeration is contraindicated. Patients requiring amputations who are not aged, who show no significant infection or general sepsis and whose general reserve is good are better managed under general anesthesia. Amputation for Buerger's disease should not be done under refrigeration because of (1) the vasospastic tendencies, (2) the lack of general toxemia and (3) the younger age level. Refrigeration amputation should be reserved for those patients who, because of senility, uncontrolled diabetes, infection, general sepsis or other complications would be poor risks for general anesthesia. Several different techniques are used, depending on the clinical picture. The authors differentiate between surgical refrigeration and preliminary control refrigeration and further divide surgical refrigeration into primary and secondary types. These may be used singly or in combination. Proper use of these different techniques will give best results.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted

British Journal of Tuberculosis, London *

38:37-102 (April-July) 1944

Pulmonary Hydatid Disease N. R. Barrett and D. Thomas—p. 39

British Medical Journal, London

2:137-168 (July 29) 1944

Localization in Cerebrum and Cerebellum: Bertram Louis Abrahams

Lecture E. D. Adrian—p. 137

Some Problems in Riboflavin and Allied Deficiencies H. S. Stannus—p. 140

Postoperational Strain in Navy D. Curran and G. Garman—p. 144

Schick Reactions in Recently Confined Women and Their Infants G. P. Wright and W. M. Clark—p. 146

Radiotherapy of Ectopic Calcification E. Millington—p. 148

Schick Reactions in Recently Confined Women and Their Infants.—Wright and Clark made Schick tests during the first five days after delivery on 250 women. Schick tests were also carried out at some time during the first five days of life on the infants of 145 of this group of women. The authors found that considerably less than half of the infants born to women living in a typical outer London suburb have an adequate congenitally acquired immunity to diphtheria. So infrequently do the mothers come into contact with toxigenic *Corynebacterium diphtheriae* that their circulating antitoxin concentrations fall to levels considerably below the critical titer for the Schick test. While a large proportion of the positive reactors among these recently confined women are themselves immune in consequence of the promptitude with which their antitoxin forming tissues respond to the secondary stimulus of the specific toxin, their low antitoxin titer during pregnancy confers little or no immunity on their infants. In the event of an epidemic rise in diphtheria two possible measures might be instituted. First, infants might be immunized considerably younger than is now the custom: this procedure has the disadvantage that very young infants seem to respond less well to prophylactic immunization than older infants or young children. Secondly, it might be desirable to immunize all Schick positive pregnant women during the latter part of the gestation period. Such a procedure would at the same time immunize any woman who was susceptible and raise the maternal antitoxin titer to a high level about the time of the birth of the infant.

Journal of Pathology and Bacteriology, Edinburgh

56:145-288 (April) 1944

Pinealoma: Its Relationship to Teratoma Dorothy S. Russell—p. 145

Sources of Blood Platelets and Their Adhesiveness in Experimental Thrombocytosis Helen Payling Wright—p. 151

Spontaneous Folliculitis of Conjunctiva in Grivet and Vervet Monkeys (*Lasioptys Griseoviridis* Syn *Cercopithecus Aethiops* and *L. Pygerythra* Syn *C. Pygerythra*) and the Susceptibility of Grivet to Trachoma Virus J. O. W. Bland—p. 161Filtration of *Mycobacterium Tuberculosis* and *Mycobacterium Stercoris* Through Gradocol Membranes M. A. Soltys and A. W. Taylor—p. 173

Developing Factor in Experimental Blastogenesis J. C. Mottram—p. 181

*Anemia Associated with Infection M. T. Saifi and Janet M. Vaughan—p. 189

Architectural Structure of Upper End of Femur in Various Pathologic Conditions W. Townsley—p. 199

Chronic Human Carrier of *B. Aertrycke* (Bact. Typhi Murium) Treated by Cholecystectomy H. Burt—p. 209

Toxic Effects of Propamidine, with Special Reference to Treatment of Burns J. W. Allen, F. Burgess and G. R. Cameron—p. 217

Diabetogenic and Pancreatotropic Actions of Ox Anterior Pituitary Extract in Rabbits R. F. Ogilvie—p. 225

Incidence and Causes of Discrepancies in Results of Serologic Tests for Syphilis T. M. Berger and P. L. Sutherland—p. 237

Anemia Associated with Infection.—Saifi and Vaughan investigated hemopoiesis in acute and chronic infections. The peripheral blood picture was studied over varying periods in three different types of cases: (1) mild infections such as furunculosis, acne and sties, (2) acute infections of not more than three months' duration and (3) subacute and chronic infections of more than three months' duration. Patients receiving sulfonamide drugs in a bigger total dose than 1 Gm have been excluded, since these drugs have an effect on hemopoiesis in

certain individuals. In the acute cases blood examinations were made every four or five days. In some instances reticulocyte counts were made daily. In the chronic cases the blood was examined at first every week and then every fortnight. A complete histologic study was made of the hemopoietic tissues in patients who died during the investigation. It was found that anemia was normocytic or microcytic in type, the color index never being above unity. A raised reticulocyte count occurred commonly in the chronic cases with severe anemia. In acute cases the reticulocyte count often rose when fever abated. Increased activity of the marrow was found in 12 of 15 cases examined, leukopoiesis predominating. There was no aplasia of erythropoietic tissue, primary erythroblasts and normoblasts being present with few mature red cells. The degree and character of the response appeared to be unrelated to the type of infection, the severity of the anemia or the age of the patient. It is suggested on analysis of the available evidence that anemia associated with infections is due to interference with the synthesis of hemoglobin.

Lancet, London

2:131-164 (July 29) 1944

Rehabilitation of Injured in This War and Last H. A. T. Fairbank—p. 131

Naval Experience in Relation to National Health Service S. Dudley—p. 134

Burns in Warfare N. J. Logie—p. 138

Treatment of Varicose Veins by Diathermy R. A. Smith—p. 141

*Synergic Action of Penicillin and Sulfonamides J. W. Bigger—p. 142

Traumatic Retroperitoneal Rupture of Duodenum P. A. Trafford—p. 145

Relapse of Quartan Fever After Twelve and Twenty One Years P. G. Shute—p. 146

Synergic Action of Penicillin and Sulfonamides.—The success which has attended the treatment of streptococcal, pneumococcal and gonococcal infections in man with the sulfonamides has not been repeated when the infecting organism is the staphylococcus. Penicillin is much more potent against staphylococci than is the best of the sulfonamides, but, despite the susceptibility of these organisms to penicillin in vitro, treatment of human infections, even when continued for a relatively long time, often fails to eliminate the bacteria completely from the body. It seems to be almost a universal practice, when penicillin treatment is initiated, to abandon the administration of sulfonamides if they have previously been employed. Bigger records experiments in which the method used has been titration of penicillin, with or without sulfonamide, in broth or serum-saline in 5 cc. amounts, the test organism being usually *Staphylococcus pyogenes*. The tubes were observed after twenty-four hours or in some cases longer periods of incubation for evidence of growth of the bacteria inoculated. The presence of sulfathiazole in broth greatly increased the dilution at which the inhibitory action of penicillin on staphylococci could be demonstrated. Sulfathiazole was more effective in this respect than either sulfanilamide or sulfapyridine. The same synergic action of sulfathiazole and penicillin can be demonstrated in serum. The action of penicillin against *Streptococcus pyogenes* is similarly reinforced by the presence of sulfathiazole. It is suggested that this synergic action of sulfonamides and penicillin should be employed in the treatment of suitable infections in man.

2:165-196 (Aug 5) 1944

*Primary Tuberculous Infection in Nurses Manifestations and Prognosis M. Daniels—p. 165

*Resuscitation of Battle Casualties D. S. Dick—p. 170

Intraoral Splint for Facial Palsy A. G. Allen and D. W. C. Northfield—p. 172

*Note on Commonly Unrecognized Type of Injury to Cervical Spine and Spinal Cord in Association with Head Injuries F. M. R. Walshe—p. 173

Antibacterial Values of Ethylene Glycol Monophenyl Ether (Phenoxetol) H. Berry—p. 175

Phenoxetol in Treatment of Proctean Infections J. Gough H. Berry and B. M. Still—p. 176

Spontaneous Rupture of Esophagus J. L. Collis, D. R. Humphreys and W. H. Bond—p. 179

Note on Thomas Splint C. A. Pannett—p. 180

Primary Tuberculous Infection in Nurses.—Daniels reviews data obtained through the Prophit survey, which was inaugurated in 1934 by the Royal College of Physicians of London under the terms of the Prophit bequest. Nurses form only one of the five groups studied in the survey, the others

being medical students, contacts, volunteer controls and boys in the Royal Navy training establishments. Since the outbreak of war it has been impossible to continue the work in the last two groups. Each person entering the survey is required to fill in a record card, giving information on age, environment, race, previous illnesses, history of contact and previous occupation. This information is supplemented by the results of an initial Mantoux test and an initial x-ray film of the chest. Each person is reexamined annually by Mantoux test and x-rays, and note is taken of any clinical illness during the period since the preceding test. It becomes possible then to analyze the progress of groups with different backgrounds and different states of tuberculin sensitivity under differing conditions of exposure. This report analyzes data collected on nurses. The total number of nursing entrants to the survey up to March 1943 was 3,764. Nurses were Mantoux tested and x-rayed shortly after entry to the preliminary training school. Of the 3,764 entrants, 50.3 per cent were positive to old tuberculin 1:10,000 or 1:100,000, 30.5 per cent were positive only to 1:100 or 1:1,000 and 19.2 per cent were negative. The rate of Mantoux conversion in the first year was 58.4 per cent and 78.3 per cent in two hospital groups. The group with a higher conversion rate had a high proportion of strongly positive reactions revealing conversion. Most had no notable symptoms between the last negative test and the first positive. A study has been made of the tuberculous morbidity in nurses who entered the survey before 1942 and whose chest x-ray film on entry was clear: 33 cases occurred in 452 nurses initially Mantoux negative, 43 cases in 2,120 nurses initially Mantoux positive. The 33 cases arising in nurses Mantoux negative on entry are briefly described. Analysis reveals the diversity of aspects of tuberculosis following primary infection in adults. In many cases it is difficult to determine whether the primary focus or a secondary infection is responsible for the lesion observed. The annual case rate per thousand was 7.4 in nurses Mantoux positive on entry and 18.8 in those Mantoux negative. The rate was particularly high in the first year after Mantoux conversion. The evidence of this survey, and the combined evidence of twenty other surveys, show that the risk of tuberculosis developing after primary infection in young adults is a serious one. It is suggested that a controlled method of antituberculosis vaccination is needed. In the absence of vaccination, recommendations are made with the object of reducing the primary infection rate, detecting primary infection when it occurs and reducing the tuberculosis morbidity.

Resuscitation of Battle Casualties.—Dick's transfusion unit dealt in eighteen months with over 800 shocked patients. Transfusion of blood and plasma was undoubtedly the major factor in the resuscitation of these cases. The total amount of fluid used was 1,776 pints (average per patient 3.54 pints), which included 1,327 pints of blood, 315 pints of plasma and 134 pints of saline solution. Usually the transfusion of 2 pints at a fast rate was sufficient to restore the blood pressure. If after this the response was only sluggish, it was found better to take the lesser risk of earlier operation. The average time spent in the resuscitation ward was about two to four hours. In practically all cases the transfusion was continued in the operating theater and often in the postoperative ward as well. Severe blood loss at operation was met by rapid transfusion, and on occasion a second separate transfusion apparatus was set up on another limb. With such a procedure it was not uncommon to give before, during and after operation a total of 10 pints of blood without any question of overloading the circulation. This method of continued transfusion is perhaps not widely enough appreciated, and there is a false belief that resuscitation is usually only a preoperative measure. There has been a good deal of controversy over the relative merits of blood and plasma in the field. The author mentions the deceptive appearance of recovery gained by plasma transfusion after severe blood loss. This fact, together with the undoubted efficacy of stored blood, was borne out in two invasions. In the first, no stored blood was available. The fresh blood was reserved for cases of extreme blood loss. For the moderately severe cases reliance was placed wholly on plasma, and it was found that the blood pressure was restored without difficulty, but again the pulse rate remained relatively high; also it was apparent that postoperatively the cases did badly. In the second

landing stored blood was available in quantity, but otherwise the conditions were similar. The results of transfusion in resuscitation were strikingly better and the condition of the patients after operation was much more encouraging. Reactions were fewer with stored blood than with plasma. With the blood, 5 per cent of the patients developed reactions in the form of slight or moderately severe rigors. With wet plasma the reaction rate was 7 to 8 per cent, but with the dry plasma this rate was around 20 per cent. Stored blood kept in good condition for at least twenty-one days in the refrigerator lorry, even during movement over rough roads.

Commonly Unrecognized Injury of Cervical Spine.—Walshe in 1936 with Ross reported cases of relatively mild head injury with associated damage to the cervical spine and spinal cord, in which the latter components had escaped notice during the period of treatment and had later been diagnosed under various titles as nontraumatic. Since then the author has observed further cases of this combined head and neck injury. The head injury is of the closed variety and is commonly mild. The injury involves a blow on the vertex or side of the head with an associated anterior or lateral flexion of the neck. The patient dives into shallow water, is thrown from horse or cycle, is flung out of a car or has fallen forward, striking the top of his head. In 1 case a sack of grain fell through an open hatch on the head of a man standing below. The mechanism of this cervical vertebral injury and its site of election between the fifth and sixth cervical vertebrae were described by Jefferson in 1928. The partial extrusion of the intervertebral disk has not been mentioned as a component of this injury, but in 1 recently observed case the narrowing of the relevant intervertebral space suggested that this had occurred. When he first comes under observation, still concussed or just recovering from concussion, the patient who has sustained this vertebral cord lesion is thought of as having head injury. The cord damage is not profound. "No one would listen to me when I complained about my arms" is the not rare later complaint of these patients. It is only when the patient is mobilized that the range of his disability becomes fully apparent to him and he may then find himself stiff and clumsy on his legs. Commonly he returns home and may even attempt to resume work. This he finds difficult. In a few weeks he notices that some muscles in the arms or hands are wasting, and he returns to his medical adviser. The condition is then labeled amyotrophic lateral sclerosis or disseminated sclerosis or, if a positive Wassermann reaction exists, the case is diagnosed as spinal syphilis. The clinical picture bears a superficial resemblance to motor neuron disease (amyotrophic lateral sclerosis, progressive muscular atrophy), yet the state of the tendon jerks in the arms, the persistence of paresthesias and the history suffice to make differentiation simple. The common failure to recognize this damage, with the subsequent tendency to erroneous diagnosis, may react unjustly on the sufferer's right to compensation. Some of these patients recover. Others remain with a fixed degree of disability, while yet others continue to deteriorate for some time as joint and muscle changes ensue.

Medical Journal of Australia, Sydney

2:1-24 (July 1) 1944

- Influenza and Other Respiratory Infections. F. M. Burnet.—p. 1.
Culture of Tubercle Bacilli from Sputum: Review of Personal Experience of 310 Specimens. D. B. Rosenthal.—p. 6.
Medical Aspect of Naval Recruiting. W. E. Roberts.—p. 8.
Clinical Impressions of Skin Disease in Tropical Operational Area. W. K. Myers.—p. 10.

2:25-48 (July 8) 1944

- Dr. E. S. P. Bedford and His Hospital and Medical School of Saint Mary's, Van Diemen's Land. W. E. L. H. Crowther.—p. 25.
Treatment of Ingrowing Toenails. T. E. Wilson.—p. 33.
Gas Gangrene at Australian General Hospital in Owen Stanley and Buna-Gona Campaign. K. C. Ross and W. P. Ryan.—p. 35.

Gas Gangrene in the Owen Stanley and Buna-Gona Campaign.—According to Ross and Ryan the Owen Stanley and Buna-Gona campaign was noteworthy for the relatively high incidence of anaerobic infection of wounds. During the four month period from Nov. 1, 1942 to Feb. 28, 1943 1,815 Australian battle casualties were treated and 82 cases of clinical gas gangrene occurred (4.5 per cent). Of these 82 patients,

12 died. Amputation was performed as often for the nature of the wound as for the extent of the infection. Exhaustion and emaciation contributed to the mortality. The clinical types ranged from the classic fulminating infection to cases associated with merely a local abscess around a retained missile. The latter cases with frank pus formation were diagnosed only by the presence of gas in the pus and by the growth of *Clostridium welchii* in culture. In 3 patients there was little evidence of infection in the wound itself, but an acute, overwhelming cellulitic edema spreading from the wound commenced four to five days after the receipt of the wound. In 2 of these cases the wounds were trivial. Death occurred in each case within forty-eight hours of the commencement of the edema. *Clostridia* were isolated from all. All patients with gas gangrene were given a full course of sulfanilamide. Polyvalent antitoxin was given to 51 patients in doses of 20,000 to 200,000 units, the usual dose being 50,000 units. It is difficult to assess the value of antitoxin, but the impression was gained that it had some beneficial effect. Forty-nine patients received transfusions of blood and plasma. The initial amount was usually 1 liter of blood and 1 liter of plasma. A full course of antimalarial therapy has to be given to patients receiving blood collected in a malarious area. One of the authors had success with radical excision in the Libyan Desert. Therefore it was decided to employ this wherever possible and to be conservative with amputations. At first, whether anaerobic infection was present or not, operations took the form of débridement and partial excision rather than radical excision; but the authors soon learned to rely more and more on radical excision, no matter how old was the wound. Excision caused little or no local or general reaction, and several partly excised wounds needed reexcision a few days later. The authors became convinced that the time factor did not matter, and with adequate resuscitation they excised the wounds as completely as the anatomic situation would allow.

Journal de Radiologie et d'Électrologie, Paris

25:189-216 (1942-1943)

- Failures in Radiation Therapy of Fibroma. J. Dueuing.—p. 189.
 *Late Results of Roentgenotherapy of Glossoepiglottic Epitheliomas. F. Baclesse.—p. 190.
 Treatment of Tuberosus Angiomas of Young Children. S. Laborde.—p. 193.
 Radium Therapy of Angiomas. L. Mallet and C. Proux.—p. 196.
 Urethrographic Exploration of Cancers of Prostate. Mathey-Cornat and H. Duvergey.—p. 199.
 Submicroscopic Study of Human Bones by Diffraction of X-Rays. P. Lamarque and J. Mering.—p. 201.

Late Results of Roentgenotherapy of Glossoepiglottic Epitheliomas.—Baclesse differentiates epitheliomas of the oropharynx into two groups: (1) those of the lingual base and (2) those of the valleculae and of the epiglottis which develop in the space between the steepest part of the pharyngeal slope, the glossoepiglottic folds and the free edge of the epiglottis. This differentiation is of importance in statistical evaluation because in the first group the results have been much less favorable than in the second. The author reviews the results obtained in 256 patients with epitheliomas of the oropharynx which were treated at the Curie Foundation between 1920 and 1938 inclusive. The minimum period of observation was four years. The author takes into account the local extension, the lymph node invasion and the anatomic and clinical aspects. Among the 256 patients there were 89 in whom the cancer was still localized. Of these, 18 (20 per cent) were cured, whereas of the 167 patients with cancers which had already invaded adjoining regions only 5 (3 per cent) were cured. Classification of cancers according to presence or absence of lymph node invasion revealed that the percentages of cure were 16 in those without and 6 in those with invasion. From the anatomoclinical and radiographic points of view the author differentiates four types of glossoepiglottic epitheliomas: (1) the proliferating types, which extend on the surface, do not invade and extend toward the lumen of the oropharynx; (2) the ulceroproliferating type, which is likewise superficial; (3) the interstitial or infiltrating types and (4) the invasive types, which destroy the organ by ulceration. Of the total of 23 cured patients 16 had the proliferating type of cancer and 7 the ulceroproliferating type. None of the patients who had interstitial (infiltrating) or invasive cancers were cured.

Ophthalmologica, Basel

105:1-64 (Jan.) 1943

- Injury of Trigeminal Nerve by Retro-Orbital Grenade Splinter; New Case. Lieux and R. de Saint-Martin.—p. 1.
 Simple Method for Stereoscopic Visualization of Ocular Fundus Using Ordinary Monocular Ophthalmoscope. J. W. Wagenaar.—p. 13.
 New Family with Doynne's Discoid Cataract (Cataracta Centralis Pulverulenta). M. Girardet.—p. 24.
 *Cholinesterase Content of Eye. R. Brückner.—p. 37.

Eye and Cholinesterase.—Brückner presents investigations on the presence and importance of cholinesterase in the eye, particularly in the aqueous humor and in the vitreous body. Studies on horses and cows revealed that cholinesterase is a regular constituent of the aqueous humor and it is assumed that this is the case also in man. The esterase found in the aqueous probably is derived not from the blood but from other sources. The esterase values of the vitreous body of cows, calves and hogs were several times as high as those of the aqueous humor; in cows it was four times higher than in the serum; in horses the esterase values of the vitreous body were occasionally lower than in the aqueous. In cows the concentration of esterase varied in the different parts of the vitreous: the concentration was greatest in the peripheral zones. The esterase of the vitreous body is probably derived chiefly from the retina.

Bol del Inst. de Clínica Quirúrgica, Buenos Aires

20:521-592 (April) 1944. Partial Index

- *Prothrombin in Preserved Blood. R. F. Banfi, R. Bay and C. A. Tarruri.—p. 521.
 Persistence of Ductus Arteriosus. R. Dambrosi and E. Gobich.—p. 540.
 Abscess of Lung. A. S. Lentino.—p. 545.
 Use of Vitamin K. C. Morel.—p. 581.

Prothrombin in Preserved Blood.—Banfi and his collaborators found that the time of coagulation and the amount of prothrombin in preserved blood and preserved plasma do not change during the first three days of conservation. The coagulability diminishes slowly but continuously up to a point of final incoagulability of plasma conserved for five months and to which thromboplastin and calcium are added. The amount of prothrombin in the blood and plasma increases during the first three days up to double values in relation to the initial figures. This early increase of prothrombin in the blood and plasma seems to be due to rapid formation of the substance through its sensitization during the process of disintegration of platelets. After the third day prothrombin diminishes down to figures as low as 30 per cent in five months in relation to the initial figures. Transfusion of blood or plasma, when it is preserved for a certain time, is of no therapeutic value in controlling hemorrhage due to hypoprothrombinemia.

Obstet. y Ginec. Lat.-Americanas, Buenos Aires

2:417-512 (June 30) 1944. Partial Index

- *Pregnancy and Cancer of Cervix. C. Mönckeberg B.—p. 417.
 Quadruple Pregnancy. J. Di Bitonto and S. Wilber.—p. 465.

Pregnancy and Cancer of Cervix.—Mönckeberg B. encountered 20 women with cervical cancer among 36,500 pregnant women who were observed in a maternity ward in the course of ten years. All the patients but 2 were under the age of 40. All but 1 were multiparas. They complained of hemorrhage small or moderate, continuous or intermittent. Cancer was recognized during the last half of pregnancy in the majority of the cases. It was of the type of cellular epithelioma in 11 cases. The author advises local examination and biopsy as a routine in pregnant women complaining of hemorrhage during pregnancy. Pregnancy aggravates cancer of the neck, which in its turn predisposes the patient to abortion. Roentgen therapy and radium therapy are interdicted as dangerous for the infant. The author advises the following scheme: (1) Immediate hysterectomy followed by transpelvic roentgen therapy for women with operable cancer before the sixth month of pregnancy, (2) postponement of operation up to full term, abdominal cesarean section at full term and total hysterectomy followed by roentgen therapy and radium therapy in women with operable cancer beyond the sixth month of pregnancy and (3) abdominal cesarean section at full term, and subtotal hysterectomy followed by roentgen therapy and radium therapy in women with inoperable cancer before or after the sixth month of pregnancy.

Book Notices

Global Epidemiology: A Geography of Disease and Sanitation. By James Stevens Simmons, B.S., M.D., Ph.D., Brigadier General A. U. S., Tom F. Wayne, A.B., M.D., Lieutenant Colonel, M. C., A. U. S., Gaylord West Anderson, A.B., M.D., Dr.P.H., Lieutenant Colonel, M. C., A. U. S., Harold MacLachlan Horack, B.S., M.D., Major, M. C., A. U. S., and Collaborators. Volume One. Part One: India and the Far East; Part Two: The Pacific Area. Cloth. Price, \$7. Pp. 504, with illustrations. Philadelphia, London, & Montreal: J. B. Lippincott Company, 1944.

This is the first volume of what is no doubt a unique work in medical publication. As a part of the work of the Division of Medical Intelligence in the Bureau of Preventive Medicine in the Office of the Surgeon General, information regarding medical conditions in every area throughout the world has been assembled. The information is here coordinated and presented in such form as to be exceedingly useful to every one concerned with health in far parts of the world. Thus, for Burma there is a discussion of its geography and climate, of the organization of its public health services, its medical facilities, the diseases that are prevalent and the nature of their spread, with a good summary and a bibliography. The major problem of public health in Burma was malaria. Other important diseases are listed. Each of the nations investigated is given similar treatment. The book is handsomely printed in two columns, with large type and many exceedingly useful maps. This is a work of reference which should be available in every medical library and which will be found immediately useful by every physician concerned with disease in any of the nations covered. This is truly an "excursion" into the unexplored field of geomedicine. Now that airplanes have made every section of the world easily accessible, this book serves an immediate need.

Cataract and Anomalies of the Lens: Growth, Structure, Composition, Metabolism, Disorders and Treatment of the Crystalline Lens. By John G. Bellows, M.D., Ph.D., Assistant Professor of Ophthalmology, Northwestern University Medical School, Chicago. Cloth. Price, \$12. Pp. 624, with 212 illustrations. St. Louis: C. V. Mosby Company, 1944.

This book is a combination of laboratory and clinical investigations necessary to establish a basis for a more complete clinical understanding of the normal and pathologic crystalline lens. The literature has been thoroughly reviewed, and many theories are presented and discussed without an attempt being made to evaluate all of them. The author has attempted to give the essential scientific facts concerning the embryology, anatomy, histopathology and biochemistry of the lens before going on to the more interesting practical or theoretical conclusions which must be based on this material.

The early chapters are devoted to the comparative anatomy and histology of the crystalline lens. This is followed by a rather thorough discussion of the composition of the lens, which includes all the literature on the chemistry brought up to date. Many analytic tables are included. Thirty-two pages are devoted to the metabolism of the lens and capsular permeability.

The first five chapters with their numerous tables and condensations of many scientific laboratory reports will no doubt be boring reading for the average clinician, but the effort will well repay any ophthalmologist with an interest in getting below the surface of clinical case reports, as well as any anatomist, chemist or biologist who may have special interest in this important structure.

The last four chapters are of considerable interest to the clinical ophthalmologist. They include a comprehensive discussion on developmental defects of the crystalline lens and contain many case reports. Much space is devoted to cataracts due to radiant energy, electricity, deficiency of some vital constituents and toxins. The discussion on toxic cataracts is important, as such cataracts are being seen more frequently. The chapter on cataracta complicata contains reports of many unusual causes. Stress is placed on endocrine dysfunction as a cause of cataract. The discussion of senile cataract is complete and includes the operative treatment and complications of cataract surgery. This chapter should be of vital interest to the average clinical ophthalmologist.

Physiologic-chemical factors have been dealt with at length, although an attempt has been made to be both systematic and practical in proceeding from the development and growth of the lens to a consideration of its structure. After becoming

acquainted with the lenticular composition and metabolism, the reader should be well equipped to appreciate more fully the clinical problems presented in the last five chapters. The arrangement is such that a reader not interested in comparative anatomy, for instance, may pass on to parts of the subject which do interest him. The numerous illustrations are well chosen and contribute materially to the value of the book.

The author has produced an exceedingly interesting and important work, one which will take its place as the authority on the crystalline lens.

Industrial Medicine. Edited by Sir Humphry Rolleston, Bt., G.C.V.O., M.D., K.C.B., and Alan A. Moncrieff, M.D., F.R.C.P. With an introduction by Air Vice-Marshal Sir David Munro, K.C.B., M.B., Ch.B. Cloth. Price, 16s. Pp. 202, with 5 illustrations. London: The Practitioner by Eyre and Spottiswoode, Ltd., 1944.

This is a handbook, as the title indicates, with various authors contributing chapters on industrial medicine and the general practitioner, industrial poisons, industrial dermatoses, chest disease in industry, miners' nystagmus, toxic anemia, the treatment of the injured workman, backstrain, neuroses in industry, malingering, nutritional problems related to industrial workers, adolescents in industry, fatigue and boredom, lighting problems, ventilation and heating, welfare services, the works ambulance room and factory law in relation to health and welfare.

It is stated in the preface that this book resulted from the interest shown in a small symposium on industrial medicine published in the periodical the *Practitioner*. The subject of each of the chapters apparently was selected on the basis of interest and need for information on these industrial medical problems in the British Isles, miners' nystagmus being prevalent there and nonexistent in the United States. The inclusion of eighteen major subjects in 183 pages makes this a compendium and a convenient reference for those becoming interested in industrial medicine. Because of its brevity, superfluous details are omitted to make it a highly practical book, as each author has handled his assignment ably. The introductory chapter on industrial medicine and the general practitioner, by Air Vice Marshal Sir David Munro, outlines the relationship that should exist between the practitioner and industry and workers, particularly as related to the general improvement of health in industrial areas.

The book should have wide usage by general practitioners because of its practicality.

A Six Year Journey. Published by Cleveland Child Health Association. Leyton E. Carter, Director of the Cleveland Foundation. Paper. Pp. 14, with illustrations. Cleveland, Ohio, 1943.

This is a report issued by the Cleveland Child Health Association of a project begun in 1937 dealing with preschool children. The study began when it was realized that children entering Cleveland's public school kindergartens showed an alarming number of physical defects, which could have been avoided with proper preventive work during the preschool years. There were approximately fifty organized school centers where the children received from almost no care to excellent care. The latter was given only at those centers where the parent paid a fee. There was no uniformity among these various centers. The association then defined through its standards committee the meaning of a "good nursing school." Through the efforts of this association the standards in all centers began to rise. There is now a great need for such centers, and this booklet will be of help to those groups that are planning to form and maintain such centers or schools.

The Experiments of Nature and Other Essays. By Irvine McQuarrie, Ph.D., M.D., Department of Pediatrics, The Medical School, University of Minnesota, Minneapolis. Delivered at the University of Kansas School of Medicine, Lawrence, Kansas. Porter Lectures Series XII. Cloth. Price, \$1. Pp. 115, with 16 illustrations. Lawrence, Kansas: University Extension Division, University of Kansas, 1944.

Three scholarly lectures delivered at the University of Kansas School of Medicine in 1942 are included in this book. The first lecture is entitled "The 'Experiments of Nature' and the Advance of Medical Knowledge." The second is on "Diseases of the Adrenal Glands in Children" and the third on "Impressions of Medical Conditions in Besieged China." They are all thoughtful and well illustrated. The first in particular is a well ordered plea for the more careful pursuit of scientific observation in clinical investigations.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MAGNESIUM AND CALCIUM PHOSPHATE CALCULI

To the Editor:—What specific foods in the diet tend to the formation of renal magnesium and calcium phosphate calculi? What part does vitamin A have in the prevention of these formations? If important, what dosage is recommended?

Major, M. C., A. U. S.

ANSWER.—The oxidation of foods within the body results in the formation of an ash. Foods in which calcium, potassium, sodium and magnesium predominate over phosphate, sulfate, chloride and the uncombusted organic acid radicals are called alkaline ash foods. Since phosphatic stones form in urine, which usually has an alkaline reaction, foods which cause this reaction should be restricted. As a general rule, vegetables and fruits are alkaline in their final reaction within the body. As a prophylactic against formation or development of recurrent magnesium and calcium phosphate calculi, Higgins has recommended the high vitamin A acid-ash diet. Restriction of foods with high calcium and magnesium concentration has also been suggested. For more specific information see Renal Lithiasis by C. C. Higgins (Springfield, Ill., Charles C Thomas, 1943) and Dietetics for the Clinician by M. A. Bridges (Philadelphia, Lea & Febiger, 1941). Clinical and experimental evidence has demonstrated the relation between vitamin A deficiency and formation of renal calculi. A vitamin A deficient diet in the white rat for ten weeks usually produces keratinization of urinary tract epithelium, for example, of the kidney pelvis. Desquamation of the epithelium and keratinization may cause sufficient irritation to produce the initial lesion, while elaboration of fibrin forms a framework for deposition of crystalline sediment and subsequent development of a calculus. The daily requirement of vitamin A is estimated to be between 6,000 and 8,000 international units for the growing child and 6,000 international units for the adult. Biophotometer tests may be utilized in management of patients with renal lithiasis to determine the response to dosage administered.

MENSTRUATION AND CLIMATE

To the Editor:—I have a 17 year old patient who menstruates every twenty-eight days when the weather is cold and every fourteen to seventeen days as soon as the weather becomes warm. This is the third summer that it has occurred. The menses started at age 13 and have been regular otherwise. The flow is moderate for five days. What, if any, is the effect of climate on the menses?

Morris Weinstein, M.D., Irvington, N. J.

ANSWER.—There are many circumstances which can alter the periodicity of the menstrual flow. Among them are marriage, pregnancy and labor, change of climate, change of occupation, illness and mental or physical shock. The exact effect of climate on the menses has not been agreed on. Thus, while it is generally believed that in countries where the temperature is high most of the time the onset of menstruation occurs earlier than in countries of moderate or low temperature, this belief has not been definitely proved by statistics. Usually change of climate and change of temperature produce an amenorrhea rather than an alteration in the frequency of the menses. The case cited is unusual, but the occurrence does not mean that there is anything wrong with the patient. Treatment is not necessary.

SUTURES FOR HERNIOTOMY

To the Editor:—A few patients who have had recent herniotomies have told me that their periods of stay in the hospital were only one week. Apparently there have been no recurrences of the hernia. In order to discharge hernia cases so soon is there any special suture or unusual type of stitch required?

Ranson B. Baker, M.D., Rawlins, Wyo.

ANSWER.—Generally speaking, there are three types of sutures utilized in the repair of hernia: (1) the absorbable type represented by catgut, (2) the unabsorbable type represented by fine silk or cotton and (3) the fascial type. Most surgeons still adhere to the absorbable type, some preferring chromatinized catgut because of its slow absorption. The silk suture is probably more reliable but requires the mastery on the part of the surgeon of an especially fine technique as advocated by Halsted. Of late there has been a renewed interest on the part of some surgeons in the use of autoplasmic fascial repair. McArthur, Gallie and

LeMesurier advocated long ago the use of both living and dead fascial strips for the repair of inguinal hernia. They have demonstrated in experiments and from microscopic studies that autoplasmic suture heals and lives in situ; it is not absorbed and does not slough. McArthur's technic consisted in splitting a strip from the aponeurosis of the external oblique without detaching it, threading it onto a needle and accomplishing the Andrews imbrication operation with it. If one was to rely for his results on the suture rather than on the method, the autoplasmic fascial suture of McArthur is undoubtedly the most reliable. However, the technic is rather clumsy and difficult and time consuming.

Regardless of the type of suture used, the tendency is not to permit patients early rising after an inguinal herniotomy. The success of the operation depends on the proper healing of the coated layers.

RESTAURANT SANITATION AND CHIPPED CHINA

To the Editor:—The Columbia County Department of Health is interested in promoting publicity for good restaurant sanitation. The elimination of the many and increasing number of cracked and chipped cups in our restaurants was one of our objectives. We hesitate to do anything further about this after seeing the August issue of *Hygeia*. On page 629 is a full page advertisement by the War Advertising Council with the title "The Chipped Teacup of the Patriotic Mrs. Jones." Is it your opinion that the danger of transmission of disease through cracked and chipped cups is of greater or lesser significance than the conservation of materials during wartime? We are trying in our community to maintain good sanitary conditions in spite of lack of materials and regret the appearance of this particular advertisement in the more popular magazines. While this particular advertisement relates to home use of cracked teacups, we believe it could easily be misinterpreted.

Sue Hurst Thompson, M.D., Hudson, N. Y.

ANSWER.—From the esthetic point of view the use of chipped or cracked table ware is to be discouraged. In the presanitary days, when but limited attention was given to cleansing and disinfection, the crevices of chipped dishes were packed with particles of food and living bacteria. While it is possible to sterilize chipped or cracked dishes, few eating places carry out adequate disinfection so as to eliminate the menace of the chipped utensil. Even though replacements are now difficult, most health authorities, for the protection of the people, prohibit the use of chipped table ware.

DISCOLORATION OF TEETH FROM ERYTHROBLASTOSIS FETALIS

To the Editor:—About two years ago I had occasion to see 3 newborn infants, not related, with erythroblastosis fetalis. These infants were given repeated transfusions of Rh negative blood until the hemoglobin and red cell count ceased to drop. They were dismissed from the hospital with an iron compound added to the daily formula. In all 3 infants the iron was discontinued several months before the eruption of the first teeth. When the deciduous teeth erupted they were all deeply discolored with a grayish green pigment which seemed incorporated in the tooth structure instead of being on the tooth surface. The teeth were otherwise normal and the babies have since developed normally physically. Can you give me any explanation for this discoloration? Is it related to the iron in the formula or to the erythroblastosis? M.D., California.

ANSWER.—The discoloration of the deciduous teeth in these cases probably resulted from erythroblastosis fetalis and was caused by excessive amounts of blood pigments that were deposited during the prenatal formation of the enamel and dentin of the deciduous teeth. The deposition of endogenous pigments in the enamel and dentin during their formation and calcification has been reported in uroporphyrria and in icterus neonatorum. It is possible but doubtful that the exogenous iron given during the postnatal period contributed to the pigmentation. In iron therapy the deposits of stain are present on the surface of the tooth rather than within the enamel and dentin.

ANESTHESIA FOR CESAREAN SECTION

To the Editor:—In *Queries and Minor Notes* in the July 29 issue of *The Journal* there is a question entitled "Anesthesia for Cesarean Section in Women with Myocarditis and Renal Disorders." Long experience has taught me that a great deal more anesthesia is given during the ordinary cesarean section than is at all necessary. In my service at the Graduate Hospital of the University of Pennsylvania the rule is to prepare the woman's abdomen and catheterize before any anesthesia is given. The anesthetic is started when everything is ready to make the incision. As soon as the patient is unconscious the incision can be made and the baby extracted under a wonderfully small amount of anesthesia. If this practice is followed, instead of anesthetizing the woman thoroughly before the abdominal preoperative preparation is made it will be found that the child does not have to be resuscitated—in fact, it cries just as readily as though the operation had been done under local or spinal anesthesia.

William R. Nicholson, M.D., Philadelphia.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 126, No. 11

CHICAGO, ILLINOIS
COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

NOVEMBER 11, 1944

THE MAKING OF AN OPHTHALMOLOGIST

CHAIRMAN'S ADDRESS

CONRAD BERENS, M.D.

NEW YORK

In guiding the medical student who desires to practice ophthalmology or in advising the young ophthalmologist, stress should be laid on education, ethics, research and the importance of attending medical meetings.

Older ophthalmologists can be of great assistance to young men by merely setting a good example in clinical practice, by offering their assistance in training and by imparting the results of their experience. The question of the adequate training of the ophthalmologist seems to be especially important at this time because of the disorganization of educational opportunities and depletion of teaching staffs due to the war. Therefore this subject has been chosen for presentation. Certainly there has been excellent precedent in the Transactions of the Section¹ for this type of discussion.

EDUCATION

The medical curriculum of the ophthalmologist should include comprehensive courses in higher mathematics, biology, chemistry, physics, modern languages and, if possible, elementary courses in embryology, comparative anatomy, physiology, bacteriology and physiologic chemistry. In medical school the student should be permitted to elect certain subjects which will aid him in ophthalmology. For example, he should be encouraged to devote more attention to clinical ophthalmology than to clinical obstetrics. He should have a keen interest in the fields closely related to ophthalmology and have the privilege of continuation studies in fundamental work, particularly anatomy, embryology, pathology and immunology in relation to ophthalmology. This statement should not be construed as suggesting that the ophthalmologist's training should not be as broad as possible in general medicine but merely that some time should be available for elective studies.

After graduating from medical school there is a question of a general hospital internship. Some ophthalmologists consider this period of training a waste of time. However, the stimulation and broadening influence derived from close association with and observation of the work of the great leaders in medicine and surgery makes a general internship the most impor-

tant part of a man's medical training. A hospital where the young physician can obtain stimulation from outstanding clinicians and teachers should be his first choice. Although the American Board of Ophthalmology and most of the states require only one year of training in a general hospital, I believe that from eighteen months to two years is not too much time for the ophthalmologist to devote to this part of his training and that the major part should be devoted to internal medicine. It is regrettable that our medical students today are to have only nine months of general hospital experience and that the Army has been unable to arrange for some degree of selection of the medical school by the applicant.

The next step is usually a residency of two or three years in an eye hospital or eye department of a well equipped general hospital. During this period of training the ophthalmologist acquires by apprenticeship proficiency in the technics of operations and methods of treatment and learns to use his hands under the guidance of experienced surgeons. The clinical judgment acquired by experience aided by apprenticeship under a good clinician may be even more important than surgical technic. One of the best and most valuable parts of an eye resident's hospital training is that received from his senior resident; the young ophthalmologist should make rounds with him and observe and write his notes. In doing this he will profit greatly, as will hospital records. Unfortunately in peacetime there are not enough residencies in the country for all young ophthalmologists to receive this type of training. Therefore other means of training must be provided, for example, working in a clinic or in an office with an ophthalmologist who is a good clinician and who keeps adequate records.

If possible the student should have a course in the basic sciences related to ophthalmology before he enters active hospital work. He should work toward an advanced degree and should be stimulated to undertake a specific research problem and prepare a thesis preferably while he is having basic science training. My observation leads me to believe that men so trained make better residents and benefit more from their special hospital training. If it is not feasible to obtain a course in the basic sciences, one should attend lectures and demonstrations by members of the hospital staff, attend meetings of ophthalmologic sections and enroll in the Home Study Course sponsored by the American Academy of Ophthalmology and Otolaryngology under the direction of Dr. Harry S. Gradle.

The education of war veterans presents a special problem. Many of our young men have been called into the military services in the middle of their hospital or basic science training. Even before the President's message to Congress concerning the postwar education of veterans for from one to three years, ophthalmolo-

¹Read before the Section on Ophthalmology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.
²I. Knapp, A.: Importance to the Practicing Ophthalmologist of Contributing to Literature. Tr. Sect. Ophth., A. M. A., 1926, p. 17. Todd, F. C.: Research in Ophthalmology and the Training of Ophthalmologists. *Ibid.*, 1914, p. 17. Holloway, T. B.: The Correlation of University Research. *Ibid.*, 1930, p. 17. Greenwood² Snell² Heckel²

gists, guided by suggestions made by Dr. Gradle, have been planning for the teaching of ophthalmology to physicians released from our armed services. The instruction will be given with little, if any, cost to our confrères who have sacrificed so much for those of us who remained at home. The undertaking of the entire expense by the government may or may not be desirable and should be carefully studied.

ETHICS

While ethics may be taught by lectures, the conduct of older ophthalmologists provides the greater stimulus. Several of our chairmen have ably presented this problem in their chairman's addresses.² The county medical societies are influential in maintaining and raising ethical standards, especially when the higher type of physicians take an active part in the work of the society. The boards of censors of these societies act on complaints from other medical practitioners and the public concerning unethical actions of member physicians.

Young ophthalmologists as well as any physician should appreciate the importance of never detracting from the standing or the work of his confrères. A man's own position is never helped when he attempts to make himself important by belittling his colleagues. Another grave mistake is to speak disparagingly of large fees obtained by other men. If the fees are large but commensurate with ability to pay and the service rendered is of high quality and honest, colleagues should be delighted. To my knowledge no honest physician ever became rich through the practice of medicine, and physicians in private practice give more of their time to charity in one way or another than they can physically or financially afford.

ETHICS AND OPTOMETRY

One of the most important problems in ethics from the standpoint of public service and public health is that of optometry. Those who believe that optometrists should be taught certain subjects and that there should be closer cooperation between ophthalmology and optometry are apparently in conflict not only with the Oath of Hippocrates, "I will impart a knowledge of the art to my own sons and those of my teachers, and to disciples bound by a stipulation and oath, according to the law of medicine, but to none other," but also with certain resolutions passed by this section in 1936, which were reaffirmed in 1942. I believe this part of the Hippocratic Oath should be reconsidered by ophthalmologists in the light of conditions existing in 1944 and that the entire matter should be returned to the individual state and county societies.

Some members of the section have said that insufficient consideration has been given to optometry and that the only place where these problems have been discussed has been in the brief executive meetings of the section. These statements have been made without knowledge of the facts, for the Section on Ophthalmology appointed a committee on optometry as far back as 1913, designating Dr. William C. Posey as chairman. This question was thoroughly and ably discussed by Hiram Woods in 1913 and by Walter B. Lancaster in 1928 in their chairman's addresses. Having served as secretary of the American Committee on Optics and Visual Physiology and as a director of the National Society for the Prevention of Blindness, I have gradu-

ally accepted the conclusion that lack of cooperation between ophthalmologists and all others concerned with vision and eye health is the most serious unsolved problem in the prevention of blindness today.

Those who have been closely associated in the study of this problem believe, almost to a man, that optometrists should be taught by those best qualified to teach subjects which would aid in preventing blindness. A recent vote taken by the American Ophthalmological Society and by this section indicates a similar opinion among a large and growing group of ophthalmologists. I believe that a careful unbiased study of the reasons why so many men are now in favor of cooperation, by those who hold opposite views, would lead to a change of opinion in many cases.

The armed forces have used optometrists under the close supervision of ophthalmologists, and in the great majority of instances of which I have personal knowledge the arrangements have been mutually satisfactory to the ophthalmologists and to the optometrists. Because of this, ophthalmologists have asked whether a similar arrangement would not be satisfactory in private practice, as this association has also proved useful in some of the nation's municipal and private hospitals. This is one problem a special committee of the American Medical Association might well study to the mutual benefit of all concerned.

In spite of the existence of the 1942 optometry resolution, we should cooperate in preventing the introduction of bills in our state legislative bodies and the publication of articles in scientific or lay journals which fan the flame of a feud. The feud between the two groups concerned with eye care not only lessens the faith of the public in all types of eye service but also shakes public confidence in medical care in general, because few laymen can define the terms optometrist, ophthalmologist and optician.

I urge each young ophthalmologist and every member of this section to study this problem from the aspect of public health, service to the public and the prevention of blindness, without prejudice engendered by personalities or by financial considerations.

FEE SPLITTING AND PARTICIPATION IN THE SALE OF GLASSES

Several of my predecessors who have discussed similar subjects³ have had nothing to say on fee splitting for operations, drugs, x-ray examinations and hospitalization. However, I believe that this practice is so little indulged in by ophthalmologists in spite of one or two recent isolated examples that it may be dismissed. All ophthalmologists should strive to eliminate these practices by their example and by aiding American medicine in the fight against this degrading and dangerous evil practice.

Profits from the sale of glasses is another matter which cannot be too heartily condemned if money is received for no service rendered or no financial risk assumed. Undoubtedly in many communities ophthalmologists must dispense their own glasses, and if the lenses were sold without profit these ophthalmologists might be in unfair competition with the opticians and other persons associated with eye care, who could not afford to dispense glasses at cost. The ophthalmologist who dispenses his own glasses usually would prefer to find a reliable optician or encourage one to settle in his

2. Lancaster, W. B.: The Optometry Problem, Tr. Sect. Ophth., A. M. A., 1928, p. 97. Snell, A.: Some Principles of Medical Ethics Applied to the Practice of Ophthalmology, *ibid.*, 1941, p. 17. Heckel, E. B.: The Ethics of Ophthalmology, *ibid.*, 1929, p. 17.

3. Greenwood, A.: The Organization and Activities of the Ophthalmic Service in the American Expeditionary Forces, Tr. Sect. Ophth., A. M. A., 1919, p. 87. Snell,² Heckel.³

community. Thus he could free himself from conducting a business which, if it continues for any length of time, frequently becomes a financial necessity.

It is my conviction that all those associated with eye care, who participate to any great extent in the sale of glasses, even though they perform a service in dispensing lenses and thus are able to charge low fees for their consultations, are in unfair competition with those who do not participate. Even when ophthalmologists or optometrists dispense glasses without profit, they are still in unfair competition with those who do not dispense their own lenses.

If when beginning practice the young nonparticipating ophthalmologist makes his fees low in order to permit him to compete with ophthalmologists and optometrists who do participate in the sale of glasses, it will later be hard for him to raise his charges. However, to start his practice with adequate fees may be so difficult as not to be practical. There is no question that it is preferable from the standpoint of the public and medicine to give honest, real medical service and charge for it than only to seem to give low cost service. Some of the plans for prepayment of medical service stress low fees for eye examination but neglect to mention profit from glasses. This tendency to cheapen the apparent cost of medical service by hidden profits should be carefully watched, studied, discouraged and prevented.

There is no doubt that the great majority of medical men, especially those who are willing to submit to regulation by organized American medicine, are ethical and wish to have nothing to do with merchandising. There are many sides to this complicated problem and many points of view which must be respected until we know every angle of the situation which has caused ophthalmologists to take a certain stand.

If all ophthalmologists and optometrists could and would free themselves from the personal dispensing of glasses, ethical standards would be raised.

This is too complex and important a subject to be discussed fully in the time at my disposal and requires study by a special committee with adequate funds to make a comprehensive investigation.

RESEARCH AND STUDY

Fortunately for the advancement of science, there are many young ophthalmologists who are interested in the broader concept of medicine. They should be associated with a clinic where they may be broadened by contact with other physicians. They should be interested in teaching and research and should stimulate others in investigative work. Some of the best and most important research may be done in the clinic.⁴

Office records should be complete so that they may be valuable for research. The young ophthalmologist should be constantly thinking of how he can improve his technic of examination and his instruments. He should attempt to make treatment less empirical. This is a form of research any one can do. Qualified men or those who can work under the supervision of competent ophthalmologists should endeavor to contribute to the knowledge of the many unsolved problems in ophthalmology, for example the etiology of chronic uveitis, cataract and glaucoma. Several foundations may be approached, if the problem to be studied is well presented and seems to offer the possibility of advancing science. The John and Mary R. Markle Foundation,

Snyder Ophthalmic Foundation, the Ophthalmological Foundation, the Josiah Macy Jr. Foundation and several others have contributed funds for research in ophthalmology.

Ophthalmologists should contribute to the literature and keep well informed concerning the writings and the technics of other surgeons and read current medical journals, not only the ophthalmic publications but also those in fields related to ophthalmology, e. g. embryology, physiology, bacteriology, immunology, pathology and, of course, psychiatry, medicine, general surgery and neurology.

ATTENDANCE AT MEDICAL MEETINGS AND PARTICIPATION IN LOCAL OPHTHALMIC ACTIVITIES

The young ophthalmologist should attend local eye meetings and contribute to them. In addition to attending local meetings of ophthalmologists he should become a member of the Association for Research in Ophthalmology. This association has been developed with the younger men in the profession in mind. The dues have been kept low, well within the financial range of the younger man who may not be able to afford the membership fee of the more expensive special medical societies. The association affords an opportunity not only to attend medical meetings but also to present the results of individual research. Certainly the younger men should have the opportunity of this form of stimulation and contact, and the holding of these meetings the day before the meeting of the Section on Ophthalmology of the American Medical Association stimulates interest in the section papers and exhibits. Derby⁵ and Feingold⁶ are former chairmen who in their presidential addresses stressed the value of attending medical meetings.

Every young ophthalmologist should join his county medical society and participate actively in the work, especially in these trying days for the world and medicine and the days to come, which can hardly be less difficult.

Every ophthalmologist should be interested in the prevention of blindness and should take an active part in the work of local societies as well as in the activities of the National Society for the Prevention of Blindness. They should interest themselves in the ophthalmologic public relations committees of the state and county medical societies, if they have been organized, or help to organize them, so that they can improve the standards of ophthalmology.

The mere existence of ethical standards cannot raise the standards of the practice of ophthalmology. The problem is more fundamental, and it is my belief that more attention should be given to selecting men for medical and ophthalmologic training because of their excellent character in addition to scientific or scholastic proficiency.

CONCLUSIONS

Because of changed conditions resulting from the war and awakened social consciousness, ophthalmologists have an important part to play in furnishing better medical service to low income groups. The needs and hopes of the free people in the world must and will be met. We may look to medicine to continue to provide unselfish leadership, scientific study and intelligent planning.

4. Berens, C.: Medical Research in Connection with Ophthalmologic Hospitals and Clinics, *Am. J. Ophth.* 7: 55, 1924.

5. Derby, G. S.: Standards of Ophthalmology, *Tr. Sect. Ophth., A. M. A., 1924*, p. 17.

6. Feingold, M.: The Habit of Attending Medical Meetings, *Tr. Sect. Ophth., A. M. A., 1925*, p. 17.

The future of ophthalmology lies in the hands of the younger men. It is the privilege and great responsibility of the senior ophthalmologists to train and guide their younger confrères, who should be stimulated and encouraged to assume leadership in formulating plans for medical service, research and the teaching of ophthalmology in the future. I am confident that leaders will be developed who will carry the fine tradition of American medicine and ophthalmology to even greater heights.

35 East Seventieth Street, New York 21.

CLINICAL USE OF PRODUCTS OF HUMAN PLASMA FRACTIONATION

I. ALBUMIN IN SHOCK AND HYPOPROTEINEMIA II. γ -GLOBULIN IN MEASLES

CHARLES A. JANEWAY, M.D.

BOSTON

PART I. ALBUMIN IN SHOCK AND HYPOPROTEINEMIA¹

A. PLASMA FRACTIONATION

As our understanding of the mechanisms of disease has advanced, the compound empirical remedies of an earlier era in medicine have been steadily replaced by specific drugs. Human blood is undergoing similar evolution as a therapeutic agent. Blood is a complex mixture of cellular elements and protein components in a menstruum which closely corresponds in composition to the interstitial fluid of the body. It is a specific remedy for one condition—hemorrhage—but has been used in the past as a "shotgun" remedy for general debility, anemia, hypoproteinemia, infection and hemorrhagic tendency. In many of these conditions only one particular component of blood is needed.

The aim of the program of plasma fractionation is to supply the various protein components of plasma in concentrated and safe form for clinical use. This program had its origins in the needs of the armed forces for a compact, stable blood substitute for emergency use in situations where the saving of space and time was of prime importance. This led to the development of concentrated human serum albumin by Cohn, Oncley, Strong, Hughes and Armstrong² from blood collected by the American Red Cross. In the preparation of human albumin, other protein fractions were obtained and studies have been directed constantly toward improvements in the products derived from them and to their wider clinical application.

From the Department of Pediatrics, Harvard Medical School and School of Public Health, and from the Children's and Infants' Hospitals, Boston.

Owing to lack of space, this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the author's reprints.

Read before the Section on Pathology and Physiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

This work has been carried out under contract recommended by the Committee on Medical Research between the Office of Scientific Research and Development and Harvard University.

This paper is No. 30 in the series "Studies on the Plasma Proteins" from the Harvard Medical School, Boston, on products developed in the Department of Physical Chemistry from blood collected by the American Red Cross.

1. This paper is a condensed summary of work which has been done by a very large group of investigators, both in the laboratory and in the clinic. For detailed reports of the various studies on the products of plasma fractionation, the reader is referred to a series of papers on "Chemical, Clinical and Immunological Studies of the Products of Human Plasma Fractionation" (J. Clin. Investigation 23, July 1944).

2. Cohn, E. J.; Oncley, J. L.; Strong, L. E.; Hughes, W. L., Jr., and Armstrong, S. H., Jr.: Chemical, Clinical and Immunological Studies of the Products of Human Plasma Fractionation: I. The Protein Fractions of Human Plasma, J. Clin. Invest. 23: 417-433 (July) 1944.

Table 1 presents schematically the various derivatives of whole blood and their clinical indications. The use of resuspended red cells, which should be an integral part of any program for the efficient utilization of human blood, has been studied both here and abroad by a number of investigators.³ It should be emphasized that the clinical uses for plasma fractionation products listed in table 1 are only those which have been proved. Much remains to be done, but it is clear that the process of separating human blood into its functional components has already provided the clinician with useful tools for the treatment and study of disease.

B. CONCENTRATED HUMAN SERUM ALBUMIN⁴

The albumin molecule differs from the molecules of the globulins in size, charge and shape. Its smaller size (molecular weight 70,000) and greater net charge account for its high colloid osmotic pressure, while its more symmetrical shape accounts for its relatively low viscosity in solution.⁵ The stability of albumin, particularly under optimal conditions,⁶ has been an important factor in its usefulness for military purposes, since it can be shipped and stored without refrigeration. Because of its high solubility, it is possible to prepare concentrated solutions in water, glucose, saline solution or any other desired aqueous medium.

Although the use of albumin dissolved in water, glucose or other diluents has many interesting possibilities, most of our knowledge has been gained with the albumin solution dispensed in the standard Army and Navy package—25 per cent solution (25 Gm. in 100 cc.) in 1.7 per cent sodium chloride with merthiolate 1:10,000 as preservative.⁷

The immediate effects of an injection of concentrated albumin are (1) increase in serum albumin concentration and consequent (2) increase in colloid osmotic pressure of the plasma. The latter leads to (3) rapid transfer of fluid from the extravascular to the vascular compartment with (4) increase in plasma volume, (5) fall in hemoglobin and hematocrit and subsequent return of (6) serum albumin concentration and (7) colloid osmotic pressure toward normal. If the blood volume is depleted before albumin injection, as in shock, the fall in hemoglobin and hematocrit and increase in plasma volume will be sustained. If the blood volume is normal before albumin, then the plasma volume increase will be in excess of normal and the hemodilution will

3. Taylor, E. S.; Thalhimer, W., and Cooksey, W. B.: The Organization of a Red Blood Cell Transfusion Service, J. A. M. A. 124: 958-960 (April 1) 1944. Cooksey, W. B., and Horwitz, W. H.: Use of Salvaged Red Cells, *ibid.* 124: 961-964 (April 1) 1944.

4. In this section the author has attempted to summarize existing knowledge concerning the uses of concentrated human serum albumin. Most of this has been gained from work carried on by my colleagues. Lieut. Comdrs. L. M. Woodruff and S. T. Gibson (MC), U.S.N.R.; Capt. L. R. Newhouse (MC), U.S.N. Lieut. J. T. Heyl (MC), U.S.N.R.; Dr. O. T. Bailey and Dr. J. G. Gibson 2d. An initial evaluation of albumin in the treatment of shock (reported by Woodruff and Gibson) led to the production of albumin for the Army and Navy under Navy contract. Since then there has been a by-product of a program to test commercial lots of albumin for acceptance by the Navy. Consequently these studies have been somewhat fragmentary, since the pressing need of the armed forces for blood substitutes prevented the planning and execution of long range experiments. Detailed studies of the action of albumin in shock have been carried out under contracts with the Office of Scientific Research and Development by Courmand, Noble, Breed, Lauson, Baldwin, Pinchot and Richards¹² and by Warren, Stead, Merrill and Brannon,¹³ whose work will be frequently referred to in the text.

5. Cohn, E. J.: The Plasma Proteins: Their Properties and Functions, Tr. & Stud., Coll. Physicians, Philadelphia 10: 149-162 (Dec.) 1942.

6. Scatchard, G.; Gibson, S. T.; Woodruff, L. M.; Batchelder, A. C., and Brown, A.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: IV. A Study of the Thermal Stability of Human Serum Albumin, J. Clin. Investigation 23: 445-454 (July) 1944. Ballou, G. A.; Boyer, P. D.; Luck, J. M., and Lum, F. G.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: V. The Influence of Nonpolar Anions on the Thermal Stability of Serum Albumin, *ibid.*

7. Newhouse, L. R., and Lozner, E. L.: The Use of Human Albumin in Military Medicine: III. The Standard Army-Navy Package of Serum Albumin Human (Concentrated), U. S. Nav. M. Bull. 40: 796-799 (Oct.) 1942.

not be sustained but will diminish over a period of several hours as excess plasma protein leaves the blood stream. This is shown by changes in hemoglobin concentration in chart 1.

The advantages of albumin for use in shock and certain forms are chiefly those of safety and of its stability; it can be transported and kept for long periods without refrigeration, while it occupies but little space. It is ready for instant injection without reconstitution, cross matching or other preliminary testing. Its safety has been borne out by experience—and with the type of control used in its production and testing, reactions are almost unknown in clinical use. Its compactness is of great assistance in administering protein to children or to patients with poor veins. Thus, when it becomes available, albumin should be a very valuable addition to the emergency kit carried by the practitioner or kept in the accident room of a busy hospital.

Albumin is indicated in the treatment of conditions in which its high colloid osmotic pressure will be advan-

ments indicate that each gram of albumin should hold the equivalent of 18 cc. of fluid in the circulation and a 5.6 per cent albumin solution should be isotonic with a 7 per cent plasma.¹³ Thus 25 Gm. of albumin is osmotically equivalent to 450 cc. of circulating plasma

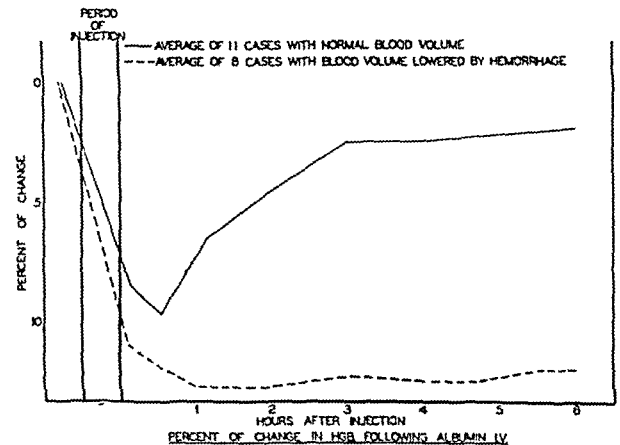


Chart 1—Contrast in the plasma volume change (as measured by the percentage change in hemoglobin concentration) after the injection of concentrated human serum albumin in a group of patients whose blood volumes had been depleted by acute hemorrhage and in a group with normal blood volumes. Note that immediate rapid hemodilution occurs in both groups (most normals received a smaller dose of albumin) but is sustained only in the group who had lost blood

or 500 cc. of citrated plasma. That these theoretical considerations are well substantiated by actual clinical experience is shown in table 2. For this reason the standard Army and Navy package contains 25 Gm., which is equivalent to the standard Army and Navy package of dried human plasma (500 cc.) but is only

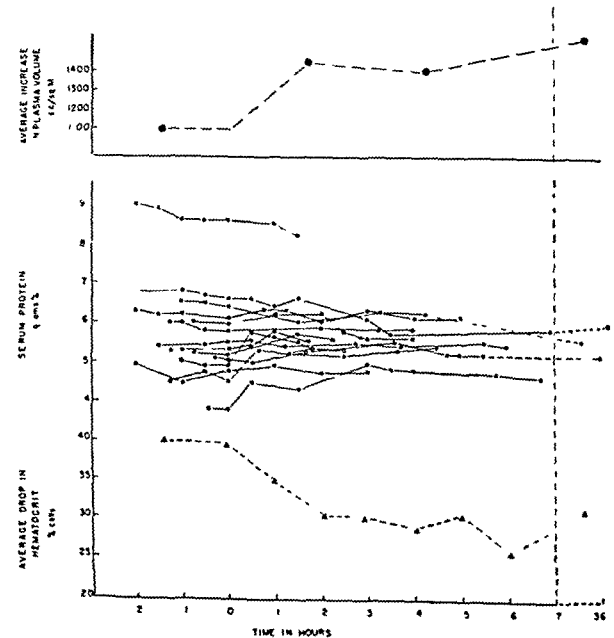


Chart 2—Changes in plasma volume, serum protein concentration and hematocrit after injection of concentrated human serum albumin in 14 cases of shock due to hemorrhage, trauma and burns. (Reprinted from the Journal of Clinical Investigation, July 1944, p. 494, with permission of the authors (Courmand and others) and editors.)

about one sixth as heavy or as bulky. In treating cases of shock, 25 Gm. doses may be repeated at fifteen to

TABLE 1.—Blood and Blood Derivatives

Derivative	Fraction	Protein	Clinical Use
Whole Blood..... ↓ (centrifuged)			Hemorrhage
1. Resuspended RBC..... + (pooled)			Anemia
2. Pooled Plasma..... ↓ (fractionated)			Burns, hemophilia, prothrombin deficiency
1. Fibrin Film.....	I	Fibrinogen	Dural substitute
2. Fibrin Foam and Thrombin.....	III 2	β Globulin	Hemostasis
3. γ Globulin Antibodies..	II	γ Globulin	Measles prophylaxis
4. Isohemagglutinin.....	III-1	β + γ-Globulins	Blood grouping
5. Albumin.....	V	Albumins.....	Shock, hypopro- teinemia, edema
6. Other Fractions.....	IV	α + β Globulins	To be determined

tageous. At present we have data on its usefulness in two such groups of conditions—shock and hypoproteinemia.⁸

In shock, whether due to hemorrhage, trauma or burns, it restores the diminished blood volume toward normal by drawing on the extravascular fluids, and this is accompanied by clinical improvement. This has been demonstrated in dogs,¹⁰ in human volunteers who submitted to large venesections¹¹ and in clinical cases of shock.¹² The blood volume changes after treatment with concentrated human albumin in a group of 14 patients with shock due to trauma, hemorrhage and burns are shown in chart 2. Osmotic pressure measure-

8. Janeway, C. A.; Gibson, S. T.; Woodruff, L. M.; Heyl, J. T.; Bailey, O. T., and Newhouser, L. R.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: VII. Concentrated Human Serum Albumin, *J. Clin. Investigation* 23: 465-491 (July) 1944.

10. Murphy, J. E., and Gibson, J. G., 2d. The Effect of Infusions of Bovine Serum Albumin in Experimental Shock, *Surgery* 14: 509-518 (Oct.) 1943. Fine, Frank and Schigman¹¹

11. Stead, E. A., Jr., and Ebert, R. V.: Studies on Human Albumin, in Mudd, S., and Thalhimer, W.: Blood Substitutes and Blood Transfusion, Springfield, Ill., Charles C. Thomas, Publisher, 1942, p. 185. Heyl, J. T.; Gibson, J. G., 2d, and Janeway, C. A.: Studies on the Plasma Proteins: V. The Effect of Concentrated Solutions of Human and Bovine Serum Albumin on Blood Volume After Acute Blood Loss in Man, *J. Clin. Investigation* 22: 763-773 (Nov.) 1943.

12. Woodruff, L. M., and Gibson, S. T.: The Use of Human Albumin in Military Medicine: II. The Clinical Evaluation of Human Albumin, *U. S. Nav. M. Bull.* 40: 791-796 (Oct.) 1942. Warren, J. V.; Stead, E. A., Jr.; Merrill, A. J., and Brannon, E. S.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: IX. The Treatment of Shock with Concentrated Human Serum Albumin: A Preliminary Report, *J. Clin. Investigation* 23: 506-510 (July) 1944. Courmand, A.; Noble, R. P.; Breed, L. S.; Lawson, H. D.; Baldwin, E. de F.; Puchot, G. B., and Richards, D. W.: Jr.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: VIII. Clinical Use of Concentrated Human Serum Albumin in Shock and Comparison with Whole Blood and with Rapid Saline Infusion, *J. Clin. Investigation* 23: 491-506 (July) 1944.

13. Scatchard, G.; Batchelder, A. C., and Brown, A.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: VI. The Osmotic Pressure of Plasma and of Serum Albumin, *J. Clin. Investigation* 23: 458-465 (July) 1944.

thirty minute intervals, but, as with plasma, in traumatic cases whole blood or red cells must be given after large doses to correct the anemia which inevitably develops.

In patients in shock who are severely dehydrated, albumin will restore the amount of total circulating

TABLE 2—Osmotic Effect of Concentrated Human Serum Albumin

Authors	No. Cases	Hours After Albumin	Average Cc Blood Volume Increase per Gm. of Albumin
Scatchard, Batchelder and Brown ¹³	Calculated from Osmotic Pressure		18
Heyl, Gibson and Janeway ¹¹ (Experimental hemorrhage)	11	1	17*
Command, Noble, Breed, Jauson, Baldwin, Pinehot and Richards. J. Clin. Investigation 23:491, (July) 1944 (Clinical shock)	12	1 2 1 6	19† 23‡
Warren, Stead, Merrill and Brannon ¹² (Clinical shock)	3	½ 1	16*

* Per gram of albumin injected (no bleeding after injection).
† These cases selected from group for comparison, since determinations were made within two hours of albumin injection.
‡ Per gram of albumin retained (11.2 cc. per gram of albumin injected)

protein to normal without harm to the patient, but unless the salt and water necessary to make up the deficit of fluid in both plasma and extracellular fluid are administered, the therapeutic effect will obviously be inadequate. This has been our experience in only a few cases of shock in civilian hospitals, all of which were caused by serious intra-abdominal disease in which vomiting had depleted the body fluids. Work on dogs¹⁴ has borne this out.¹⁵ The additional fluid does not necessarily have to be given by vein but may be given orally, if tolerated, or by any other available route.

TABLE 3—Effectiveness of γ -Globulin Compared to Other Preparations Used in the Prophylaxis of Measles (Unselected cases)

	No. Cases	No. Measles, per Cent	Mild Measles, per Cent	Average Measles, per Cent
Convalescent serum	1,627	75	17	8
Normal adult serum	384	56	24	20
Placental extract	2,740	64.3	30.4	5.3
γ -Globulin	2,321	71.5	25.1	3.4

TABLE 4—Effectiveness of γ -Globulin in Measles Tests (Selected cases. Intimate exposure, 12 years of age and under, injection before tenth day after initial exposure, satisfactory data)

Preparations Tested	No. Cases	No. Measles, per Cent	Mild Measles, per Cent	Average Measles, per Cent
40	1,165	65.8	21.3	2.9

The absence of the globulin components of plasma has not affected the usefulness of albumin in our experience with 100 shock cases, with 1 exception, a patient with a 50 per cent burn, in whom continued replacement with 300 Gm. of albumin in eighteen hours led

to hypoglobulinemia, which was readily corrected with plasma.⁸ The place of albumin in the treatment of shock is particularly in its early phases, when the emergency demands prompt restoration of blood volume, and in those cases in which peripheral circulatory failure is related to hypoproteinemia with edema. In the treatment of burns, plasma should be used to replace the losses of whole plasma, although albumin will carry patients through the first twelve hours if necessary.

The usefulness of albumin in the treatment of hypoproteinemia and edema remains to be explored to a large extent.⁸ Although we have given albumin in 25 Gm. doses daily for long periods of time to a number of hypoproteinemic patients, we have had an opportunity in only a few patients to use large doses in a short time, which seem essential for most efficient correction of hypoalbuminemia. In a number of cases of burns which had developed a syndrome of hypoproteinemia, edema and failure of the peripheral circulation as a result of treatment with large amounts of saline solu-

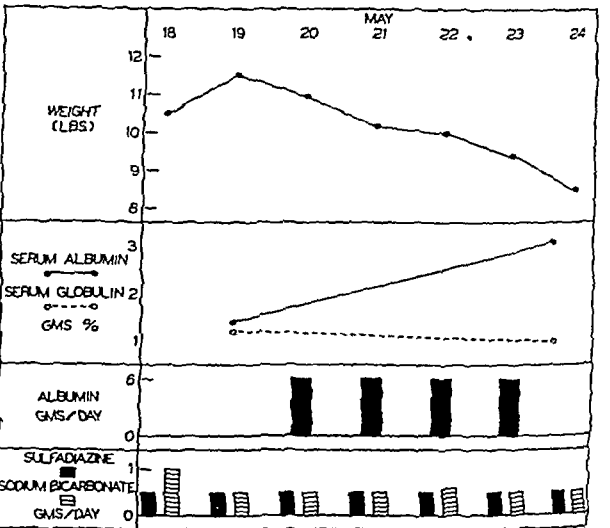


Chart 3—Clinical course of a baby with severe hypoproteinemia, who was given concentrated human serum albumin 6.25 Gm. (25 cc.) per day for four days. On May 19 the baby had severe anasarca and ascites, while on May 24 only slight edema remained about the area of infection on the forehead and scalp.

tion the infusion of 50 Gm. of albumin led to dramatic improvement. Chart 3 shows the results of administration of 25 Gm. of albumin in four days to a baby with hypoproteinemia associated with weeping eczema of two weeks' duration. The rapid decline in weight was accompanied by diuresis and disappearance of the edema and ascites, which were presumably due to hypoalbuminemia and aggravated by the administration of sodium bicarbonate. Thorn¹⁶ has emphasized the possible usefulness of albumin in cases of renal insufficiency with hypoproteinemia to raise the colloid osmotic pressure, thus increasing blood volume and glomerular filtration, and to supply protein without increasing the load of nonprotein nitrogen for the kidney to clear.

In certain chronic types of hypoproteinemia, albumin administration will increase the concentration of serum albumin if sufficiently large amounts are given. When doses of only 25 Gm. daily are used, a great deal must be given and only a small portion can be accounted

14. Fine, I.; Frank, H. A., and Seligman, A. M. Traumatic Shock. VIII. Studies in the Therapy and Hemodynamics of Shock. J. Clin. Investigation 23:731-741 (Sept.) 1944.
15. Mahoney, E. B., and Howland, J. W. Personal communication to the author.

16. Thorn, G. W. Physiologic Considerations in the Treatment of Nephritis. New England J. Med. 229:33-48 (July 8) 1943.

for in the peripheral circulation. The remainder is presumably stored or utilized while sparing other proteins, since no increase in nonprotein nitrogen excretion was observed in 3 hypoproteinemic patients whose nitrogen balance was studied during albumin therapy. In several cases of cirrhosis of the liver it has been possible to raise the level of serum albumin and to reduce the serum globulin by doses of 25 Gm. daily. In these patients some general improvement was noted, but no conclusions could be drawn concerning the control of ascites. When albumin injections were discontinued, the serum albumin level fell again within a month or two.

In patients with the nephrotic syndrome the administration of albumin was promptly followed by an increased excretion of protein in the urine.¹⁷ In certain patients no improvement was noted; in 2 children, however, the administration of very large amounts (500 Gm. to a 16 month old child in twenty days; 560 Gm. to a boy of 8 in a month) coincided with diuresis and decided clinical improvement, although in other patients this did not occur. Since the results

TABLE 5.—Use of γ -Globulin in Measles Prophylaxis in Adolescents and Adults (Over 12)

(Combined figures for 1942-43, 1943-44 seasons)

	Total	No Measles	Mild Measles	Average Measles
Intimate exposure.....	106	71 (67%)	30 (28%)	5 (5%)
Moderate or casual exposure...	106	97 (92%)	8 (7%)	1 (1%)

Comment

1. Dose 5 cc. in most cases.
2. Day of injection varied from 1 to 9 days after exposure, chiefly 4 to 6 days.
3. Attack rate in age group 10 to 14 as reported by previous workers varies from 50 per cent to 15.4 per cent. Most of our patients were over 16.
4. The low attack rate makes evaluation difficult, but the fact that mild measles was more common than average measles in each group, whereas measles is usually severe in adolescents and adults, indicates that the globulin has had an effect.

have been irregular, this problem requires much more careful study.

In the treatment of hypoproteinemia with large doses of albumin, the powerful osmotic effect of albumin must be borne in mind. The patient should be watched for signs of venous and pulmonary congestion, and observation of the hemoglobin or hematocrit should enable the physician to follow the trend of the plasma volume over short periods. We have been impressed with how well large doses of albumin are tolerated, perhaps because of the low viscosity, but we observed 1 seriously ill elderly patient in whom doses of from 75 to 125 Gm. per day (650 Gm. in six days) appeared to exceed the limits of compensation.

SUMMARY TO PART I

1. By the application of large scale methods of fractionation developed in the Department of Physical Chemistry of the Harvard Medical School to pooled human plasma from blood collected by the American Red Cross, concentrated human serum albumin, γ -globulin antibodies, isohemagglutinins, fibrin films and fibrin foam with thrombin have been made available for clinical use.

17. Luetscher, J. A., Jr.: The Effect of a Single Injection of Concentrated Human Serum Albumin on Circulating Proteins and Proteinuria in Nephrosis, *J. Clin. Investigation* 23: 365-371 (May) 1944. Janeway, Gibson, Woodruff, Heyl, Bailey and Newhouse.

2. Concentrated human serum albumin, as dispensed in the standard Army and Navy package, provides a compact, stable solution ready for immediate use in the emergency treatment of shock.

3. The use of albumin in cases of shock due to hemorrhage, trauma and burns results in an increase in blood volume, hemodilution and clinical improvement. The blood volume is increased in these conditions by approximately the amount to be expected from measurements of its osmotic pressure (18 cc. per gram of albumin).

TABLE 6.—Complications of Measles in Children Under 12 Receiving γ -Globulin

(1,168 injections; 306 cases of mild measles, 34 cases of average measles)

Age	Dose Cc./Lb. Injection	Days from Exposure to Injection	Result	Complications
2 yrs.	.02	9	Severe measles	Staphylococcus aureus pneumonia and empyema with recovery
11 mos.	.025	6	Average measles	Mild encephalitis with recovery
2 yrs.*	.025	..	Average measles	Otitis media (simple)

* Child had reaction with chills, fever and edema of eyelids day after injection of globulin.

TABLE 7.—Reactions from Injection of γ -Globulin in Measles Prophylaxis

Type of Reaction	No. Cases	No. Reactions	Per Cent of Total Reactions
Local soreness or swelling.....	16	16	50
Fever.....	11	12	38
Headache.....	1	1	3
Dizziness.....	1	1	3
Hyperactivity.....	1	1	3
Chills, fever, orbital edema *.....	1	1	3
Totals.....	31	32	100

Summary

1,843 injections; 32 reactions in 31 patients. 1.7 per cent reactions; one half local and one half general, chiefly fever, with one anaphylactoid type of reaction.*

TABLE 8.—Results in Young Adults with 5 Cc. Dose of γ -Globulin (Stokes and Maris)

Group	No. Cases	No Measles	Mild Measles	Average Measles
Immunized.....	63	54 (86%)	10*	1 (1.5%)
Controls.....	42	20 (48%)	4†	18 (42%)

* Very mild measles in 8, questionable measles in 2 (catarrhal symptoms and fever, but no rash).

† These cases more severe than in immunized group.

4. In the presence of severe dehydration, albumin must be supplemented with fluids in order to obtain the maximum therapeutic effect.

5. Albumin is an extremely safe blood derivative and can be administered very rapidly without reaction even after periods of heating at temperatures of 50 C. for as long as one hundred days.

6. Albumin can be used to correct hypoproteinemia if sufficiently large amounts are used.

21 Stokes, J., Jr., Maris, E. P., and Gellis, S. S.: Id XI The Use of Concentrated Normal Human Serum γ Globulin in the Prophylaxis and Treatment of Measles, *J Clin Investigation* **23**: 531-541 (July) 1944.

22 Ordman, C. W., Jennings, C. G., Jr., and Janeway, C. A.: Id XII The Use of Concentrated Normal Human Serum γ Globulin for the Prevention and Attenuation of Measles, *J Clin Investigation* **23**: 541-550 (July) 1944.

23 Stillerman, M., and Thalhimer, W.: Attack Rate and Incubation Period of Measles, *Am J Dis Child* **67**: 15-21 (Jan) 1944.

23a The figures for convalescent serum, normal adult serum and placental extract in table 3 are from McKahn, C. F.: The Prevention and Modification of Measles, *J A M A* **109**: 2034 (Dec. 18) 1937.

tions observed were in cases in which the attempt to modify the disease apparently failed, as typical measles developed.

3. *Reactions.*—Most physicians who have previously used placental extract for measles prophylaxis have remarked on the low incidence of reactions following

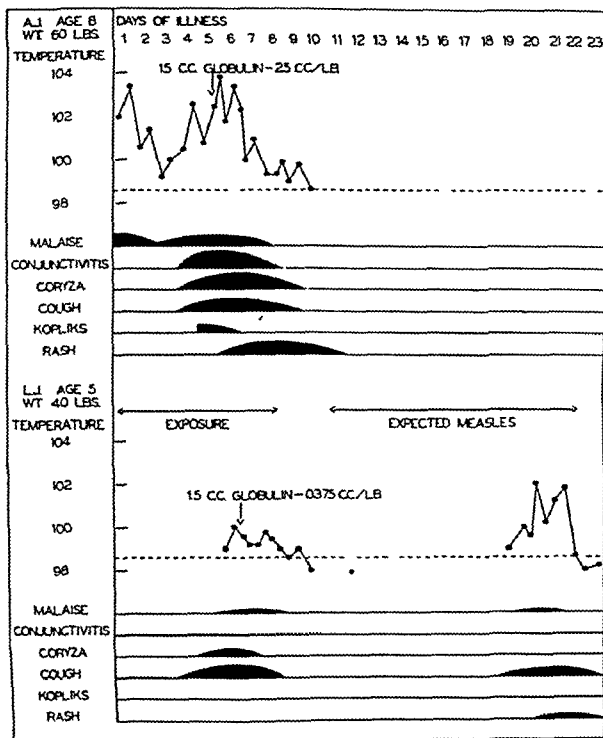


Chart 5.—Satisfactory modification of measles in a sibling intimately exposed to an older sister. The initial bout of fever in each patient may have been due to an intercurrent infection with short incubation period. The large dose of globulin given just before appearance of the rash in the older child appears to have had no effect. This has been our general experience, but Stokes, Maris and Gellis²⁴ feel that γ -globulin may be useful in the early treatment of measles. The rash in the modified case consisted of about 50 minute pink, maculopapular lesions and might have been readily overlooked.

the use of γ -globulin. The reactions reported in 1,843 intramuscular injections are presented in table 7.

4. *Dosage and Time of Injection.*—In the reports based on clinical trials in 1943, both groups of authors²⁴ came to essentially similar conclusions concerning dosage. With the large number of satisfactory reports accumulated in two seasons, it has been possible to confirm the validity of these recommendations concerning the proper dosage of γ -globulin. Study of charts 4 and 6 will show very clearly that, whereas the results in the first eight days after exposure are directly dependent on the dose of globulin (calculated on a weight basis), the interval between exposure and injection makes much less difference, although the number of cases of mild and average measles increases after the fifth day. In other words, if complete protection is desired, give 0.1 to 0.075 cc. per pound as early as possible; if modification is desired, use one fourth of this dose (0.025 to 0.02 cc. per pound) on the fourth or fifth day. The fifth day after exposure is the usual time of administration in the home, since it is the day on which the rash usually appears in the source case. These dosage recommendations will give at best only about 80 per cent satisfactory

results, since the susceptibility of the individual, as emphasized by Stokes, Maris and Gellis,²⁴ is an important variable. This is brought out by the exceptional cases in chart 4.

The proper dosage for adults is difficult to determine. Stokes and Maris²⁵ have had the opportunity to make a controlled study in a group of 107 presumably susceptible college students who were exposed to active cases of measles in several meetings. A dose of 5 cc. was given to 65 of the group and 42 were not immunized. The results are shown in table 8. This suggests that the dosage schedule worked out on a weight basis for children may be applicable to adults, since the average dose used in this group was 0.04 cc. per pound, one which would be expected to give results similar to those obtained.

5. *Mild Measles.*—The modified form of measles which results after a proper dose of γ -globulin does not differ from that previously described. Most cases are milder in all respects and briefer in duration than typical cases. Each of the cardinal symptoms—catarrh, fever, malaise and rash (including exanthem)—may occur alone or in conjunction with the others, and with varying degrees of severity. Since rash is usually accepted as an essential feature of the disease, it is hard to classify cases with fever, cough and coryza occurring twelve to fourteen days after exposure, but at least 14 such cases occurred in the group reported. Close observation of the patient is usually necessary between the ninth and twentieth days after exposure if mild measles is to be recognized, as the rash may be sparse and transitory, and the fever short lived and unaccompanied by prostration. Chart 5 illustrates satisfactory modification of measles after home exposure.

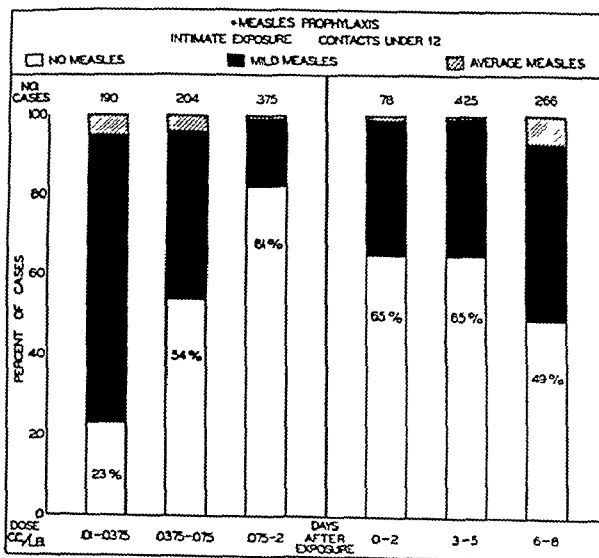


Chart 6.—Graphic summary of the data in chart 4. On the left is shown the relationship between the results and the size of the dose in patients injected within eight days of exposure. On the right is shown the relationship between the results and the time of injection regardless of the size of the dose.

6. *Duration of Immunity.*—It is probable that the duration of passive immunity depends to a considerable extent on the dose given. Evidence from last year's work indicates that a large dose (0.1 cc. per pound)

24. Stokes, Maris and Gellis,²⁴ Ordman, Jennings and Janeway²⁵

25. Stokes, J. Jr., and Maris, E. P.: Personal communication to the author

confers immunity for at least three weeks²² and that a 5 cc. dose in adolescents does not protect after six to eight weeks.

7. *Use of γ -Globulin in Institutions.*—Communicable diseases are a particular problem in institutions caring for children. The two diseases which cause the greatest difficulty in pediatric wards because of their contagiousness are measles and chickenpox. γ -globulin has proved extremely useful in controlling outbreaks of measles in pediatric wards. It has been given in thirty-five separate outbreaks to 350 susceptible children with the following results: not followed 95, no measles 241 (94.6 per cent), mild measles 13 (5 per cent), average measles 1 (0.4 per cent).

Unfortunately, a few limited trials in outbreaks of chickenpox suggest that it does not protect satisfactorily against this disease, at least in doses of 5 to 20 cc.

SUMMARY OF PART II

1. γ -globulin antibodies (fraction II of Cohn, Strong, Oncley, Hughes and Armstrong) contains most of the antibodies of pooled normal human plasma in 25-fold concentration over the original plasma.

2. γ -globulin antibodies is the safest and most effective agent available for the prevention and modification of measles by passive immunization.

3. For this purpose the injection should be given preferably on the fifth day after exposure. At this time a dose of 0.1 to 0.075 cc. per pound will completely protect most susceptible individuals, while one of 0.025 to 0.02 cc. per pound will result in mild measles in most cases.

4. The mild measles in patients receiving globulin is similar to that previously observed in patients immunized with convalescent serum or placental extract. Complications were noted in 3 out of 400 cases of measles in immunized children but occurred in patients in whom globulin failed to modify the disease.

5. Reactions were noted in only 1.7 per cent of 1,843 intramuscular injections. Half of these consisted of local soreness and most of the remainder of fever. Only one anaphylactoid reaction occurred, which was probably due to an idiosyncrasy.

6. γ -globulin is very effective in controlling the spread and severity of measles in pediatric wards but does not appear to be effective in the control of chickenpox.

CONCLUSIONS

1. Fractionation of pooled human plasma from blood collected by the American Red Cross has yielded a number of products which have important clinical applications, while others are in process of development. Two of these products are concentrated human serum albumin and γ -globulin antibodies, which are discussed in this paper.

2. Concentrated human serum albumin exerts its expected osmotic effect when injected into the blood stream and this may be utilized in the treatment of shock and hypoproteinemic edema. It is an extremely safe, convenient and effective blood derivative.

3. γ -globulin antibodies constitutes the safest and most effective agent available for the prophylaxis of measles.

CLINICAL USE OF PRODUCTS OF HUMAN PLASMA FRACTIONATION

III. THE USE OF PRODUCTS OF FIBRINOGEN AND THROMBIN IN SURGERY

FRANC D. INGRAHAM, M.D.

AND

ORVILLE T. BAILEY, M.D.

BOSTON

In the course of large scale fractionation of human blood plasma in the Department of Physical Chemistry at the Harvard Medical School¹ purified fractions of human fibrinogen and thrombin have become available in large amounts. From these proteins, several materials have been prepared for use in surgery; these materials have a wide variety of physical properties and differ greatly in the surgical uses for which they are adapted. Two products have thus far proved satisfactory in clinical and experimental trials and are now ready for distribution. One is fibrin foam, which is used with a solution of thrombin as an absorbable hemostatic agent. Another is fibrin film, which has been employed as a dural substitute and in the prevention of meningocerebral adhesions. To a less extent the solutions of fibrinogen and thrombin have been used directly in certain special locations, where they provide a physiologic adhesive material by virtue of the clot produced when they are mixed in situ.

FIBRIN FOAM WITH THROMBIN, AN ABSORBABLE HEMOSTATIC AGENT

The importance of hemostasis in surgery has been recognized as long as surgery itself has existed. Use of the ligature was known to Celsus, and his description of it was doubtless copied from still earlier sources. New technics for hemostasis in recent times, such as the silver clip and electrocoagulation, have come chiefly from neurosurgical investigators and have gradually found their way into those operations of the general surgeon, where they save time or secure more accurate control of bleeding than do traditional methods. This course has again been followed in the studies of human fibrin foam with thrombin, which was first used to control bleeding in neurosurgical operations and now promises to have use in certain general surgical procedures.

The characteristics of fibrin foam and the range of properties which may be secured by changes in the conditions of manufacture have been described elsewhere.² The fibrin foam is prepared from human

Read before the Section on Pathology and Physiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

From the Surgical Services of the Children's and the Peter Bent Brigham hospitals and from the Departments of Surgery and Pathology, Harvard Medical School.

This work has been carried out under contract recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Harvard University.

This paper is number 31 in the series "Studies on Plasma Proteins" from the Harvard Medical School, Boston, on products developed by the Department of Physical Chemistry from blood collected by the American Red Cross.

1. Cohn, E. J.; Oncley, J. L.; Strong, L. E.; Hughes, W. L., and Armstrong, S. H., Jr.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: I. The Characterization of the Protein Fractions of Human Plasma, *J. Clin. Investigation* 23: 417-432, 1944. Edsall, J. T.; Ferry, R. M., and Armstrong, S. H., Jr.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: II. The Characterization of the Products of Human Plasma Fractionation, *ibid.*

2. Bering, E. A., Jr.: On the Products of Human Plasma Fractionation: III. The Development of Fibrin Foam as a Hemostatic Agent for Use in Conjunction with Human Thrombin, *J. Clin. Investigation* 23: 586-590, 1944.

fibrinogen and thrombin and therefore is wholly composed of proteins native to human blood plasma. Its outstanding characteristics are that it rapidly controls bleeding from oozing surfaces and large veins and that it is absorbed with minimal tissue reaction when left in place at the end of an operation.

The fibrin foam has a honeycomb structure composed of fibrin with air spaces of various sizes (fig. 1).

When it is to be used as a hemostatic agent, three bottles are supplied (fig. 2). One of these contains sterile fibrin foam, another dried human thrombin and the third 30 cc. of sterile isotonic solution of sodium chloride. At the time of use the saline solution is added to the dry thrombin; solution takes place rapidly. Pieces of fibrin foam are soaked in the thrombin solution and are then ready for use in hemostasis. The fibrin foam, which is firm and somewhat brittle in the dry state, becomes rubbery and shrinks as fluid enters the air spaces.



Fig. 1.—The appearance of fibrin foam before it has been soaked in thrombin solution. Note the porous structure.

The value of fibrin foam with thrombin as a hemostatic agent is greatly enhanced by the fact that it can be left in place. Absorption is rapid and the tissue reaction excited by the presence of the material is minimal from the point of view of the histologist and negligible from the point of view of the clinician. Since the fibrin foam remains on the bleeding surface after hemostasis is complete, it entirely obviates the recurrence of hemorrhage, so troublesome when cotton materials are removed from bleeding points.

FIBRIN FOAM WITH THROMBIN IN NEUROSURGERY

The use of fibrin foam with thrombin has greatly facilitated a variety of neurosurgical procedures. The bleeding from oozing surfaces may be controlled in other ways, but the rapidity and completeness of hemostasis secured with fibrin foam materially shortens the duration of operations in which this agent is used. Moreover, fibrin foam with thrombin stops bleeding under certain circumstances in which other methods have been unsatisfactory.

For use in any neurosurgical operation the dry fibrin foam is cut up into pieces of various sizes for use in the different types of bleeding which may be expected in that particular procedure. As the operation gets under way, these are placed in the thrombin solution so as to be ready for instant use. If minute fragments are wanted for control of small bleeding points, the moist fibrin foam can be picked up with forceps and cut or pulled apart. At the time when bleeding is encountered, a piece of the fibrin foam is selected and held firmly in place with a cotton pledget, which takes up excess moisture. Suction is often useful when applied over the pledget. It will then be possible to remove the pledget without dislodging the fibrin foam. The fragment can be molded somewhat to conform to the shape of the surface and will retain the configuration after excess moisture has been removed. Should additional hemostatic material be required because of unforeseen circumstances in the course of the operation,

dry fibrin foam will be suitable for use after soaking in the thrombin solution for one minute.³

When dealing with blood vessel malformations or surfaces with bleeding from numerous small vessels, it is of advantage to slice the fibrin foam so that it forms a wafer thin plaque. The fibrin foam will not smear but retains the form into which it is pressed. Bleeding from spurting arteries is controlled with silver clips or ligatures. While fibrin foam is not recommended for brisk arterial bleeding, it will occasionally be satisfactory if applied with sufficient pressure. Fibrin foam with thrombin is also not recommended for the scalp, the cut edge of the dura or the cut edge of the bone. It is, however, of great value in dealing with bleeding from the dural sinuses and the large veins entering them. When pieces of fibrin foam are placed against torn dural sinuses or large tributary veins, control of bleeding is more effective than that secured by the use of muscle.

One of the situations in which fibrin foam has been found most useful is the outer surface of the dura beneath the margins of the bone flap. Here bleeding is often troublesome and its control may occupy considerable time. The fibrin foam can be tucked beyond the limits of the wound with safety and left in place.

Again, fibrin foam is extremely valuable in dealing with bleeding from the beds of cerebral neoplasms. By its use, certain large tumors can be removed when otherwise it might not be safe to resect them completely or to take them out en bloc when they would have to be dealt with piecemeal without this hemostatic agent. When a tumor of this sort is to be excavated or removed in toto, preparation is made by securing a large mass of fibrin foam, usually large enough to fill the entire cavity. If the cavity is larger than the largest piece of fibrin foam available, several smaller



Fig. 2.—The package now in use for distribution of fibrin foam and thrombin. The center bottle contains dry fibrin foam. The right bottle contains dry thrombin and the left bottle isotonic solution of sodium chloride.

fragments may be pressed together. While the pieces of fibrin foam do not fuse, they adhere to one another well enough to make a compact ball. The application

3. Bailey, O. T., and Ingraham, F. D.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation. XXI. The Use of Fibrin Foam as a Hemostatic Agent in Neurosurgery; Clinical and Pathological Studies. *J. Clin. Investigation*, 23: 591-596, 1944. Ingraham, F. D., and Bailey, O. T.: The Use of Products Prepared from Human Fibrinogen and Human Thrombin in Neurosurgery: Fibrin Foams as Hemostatic Agents; Fibrin Films in Repair of Dural Defects and in Prevention of Meningocerebral Adhesions. *J. Neurosurg.* 1: 23-39, 1944.

of several small bits of fibrin foam to a bleeding tumor bed would allow too much blood to accumulate among them. When the mass of fibrin foam has been pressed against the tumor bed, its volume is reduced by excavating the center. A relatively thin but continuous coating of fibrin foam is thus left along the tumor bed.

We have now used fibrin foam with thrombin as a hemostatic agent in 169 neurosurgical operations. From this experience it appears to be a most valuable hemostatic agent. Use of human fibrin foam with thrombin at successive operations on one patient is not attended by any untoward results. The fibrin foam does not replace the cotton pattie as sponging material but finds its use in the control of bleeding. A new absorbable hemostatic agent has thus been added to a very restricted group of these materials now in common use.

By far the most widely used of the absorbable hemostatic materials is muscle, introduced by Cushing in 1911.⁴ Fibrin foam with thrombin is superior in several important respects to muscle for this purpose.⁵ The tissue reaction to fibrin foam with thrombin is much less than that elicited by muscle, as discussed in another part of this paper. Furthermore, the surgeon who uses muscle must content himself with the limited supply which he may obtain from the temporal muscle or perform another procedure to obtain additional material from the gastrocnemius or other muscle or depend on the chance that muscle may be secured from a concomitant operation, which is not always possible. On the other hand, fibrin foam with thrombin is ready in any amount and can be placed on the instrument table with as little concern as is given to the provision of an adequate supply of instruments. Should an emergency arise as the operation progresses, an additional supply is available in a few moments.

Fibrin foam with thrombin can also be more readily adapted to the particular bleeding area than can muscle. The foam is broken or cut to size with ease and may be molded further to fit contours once it has been placed. The structure of muscle prevents this degree of adaptability. Both muscle and fibrin foam are entirely of human origin and share the advantages of homologous materials when used for human patients.

In general, muscle has been reserved for emergencies by neurosurgeons. When serious hemorrhage occurs, such as that from a dural sinus or blood vessel malformation, hemostasis is better controlled by means of fibrin foam with thrombin than with muscle, and the large amount which must be used makes the minimal tissue reaction to fibrin foam an important consideration. Fibrin foam with thrombin finds perhaps its largest field of use in situations where muscle would seldom be employed. A great deal of time may be saved by the use of fibrin foam with thrombin to control oozing on the dura, beneath the edge of the bone flap and elsewhere. This saving of time amounts to at least half an hour and often to an hour or more in a single operation. Fibrin foam with thrombin has saved the life of some patients in whom large tumors had been removed when muscle would have been unsatisfactory as a hemostatic agent.

Soluble cellulose has been prepared for use as a hemostatic agent when soaked in thrombin solution.⁶ After the demonstration by Frantz⁷ that soluble cellulose is rapidly absorbed with minimal tissue reaction, it was used with thrombin for hemostasis in neurosurgery by Putnam.⁸ Soluble cellulose and fibrin foam are both satisfactory from the standpoint of tissue reactions. While fibrin foam is made wholly from proteins of human origin, soluble cellulose is oxidized cotton. Our clinical experience with the two materials suggests that fibrin foam is superior to soluble cellulose as a hemostatic agent in neurosurgery. The control of bleeding by means of fibrin foam depends not only on the presence of thrombin but also on the way in which the thrombin is held in the honeycomb structure of the fibrin foam. Confirmation of this is seen in the fact that hemostasis is effected even when weak solutions of thrombin are used.² The loose structure of the soluble cellulose is less well adapted for the purpose and is not effective unless a considerably greater concentration of thrombin is available. Fibrin foam also has the advantage of being more easily cut and shaped to fit the individual characteristics of the bleeding point and especially of retaining the contours of the surface to which it is molded. From the standpoint of neurosurgery, the speed and tenacity with which fibrin foam adheres to tissues is very valuable. In our experience soluble cellulose has seemed less firmly adherent and the edges of the pledget have tended to curl away from the surface to which it has been applied.

Fibrin foam with thrombin has thus proved to be an effective absorbable hemostatic agent in many different types of neurosurgical operations.

TISSUE REACTION TO FIBRIN FOAM

It is of crucial importance that the tissue reactions caused by any absorbable material be minimal if its use is to be without danger in surgical procedures. Investigations of the tissue reactions to fibrin foam have been of two types—experimental studies, chiefly in monkeys, and studies of specimens removed at second operations or necropsies.³

Fibrin foam, as it comes in the bottle, appears microscopically to be composed of loose meshed fibers; these are actually cross sections of the honeycomb structure (fig. 3). When used as a hemostatic agent in conjunction with thrombin, the spaces fill with blood clot. This is followed by a shrinking and coalescence of the fibrin. The result is a minute mass of fibrin which persists for from one to four weeks (fig. 4). The absorption of the fibrin is accomplished by the intermediation of small numbers of mononuclear phagocytes and a few polymorphonuclear leukocytes. Giant cells occasionally form about the bits of fibrin. Fibrous tissue reaction is so slight that the location of the foam could usually not be identified in specimens obtained as late as one month after operation and often could not be located at much shorter intervals. These results are in conformity with the clinical observation that no untoward sequelae have been observed following the use of fibrin foam with

4. Cushing, H.: The Control of Bleeding in Operations for Brain Tumors, with a Description of Silver "Clips" for the Occlusion of Vessels Inaccessible to the Ligature, *Ann. Surg.* 54: 1-19, 1911.
5. Ingraham, F. D.; Bailey, O. T., and Nulsen, F. E.: Studies on Fibrin Foam as a Hemostatic Agent in Neurosurgery, with Special Reference to Its Comparison with Muscle, *J. Neurosurg.* 1: 171-181, 1944.

6. Yackel, E. C., and Kenyon, W. O.: The Oxidation of Cellulose by Nitrogen Dioxide, *J. Am. Chem. Soc.* 64: 121-127, 1942. Unruh, C. C., and Kenyon, W. O.: Investigation of the Properties of Cellulose Oxidized by Nitrogen Dioxide, *ibid.* 64: 127-131, 1942.
7. Frantz, V. K.: Absorbable Cotton, Paper and Gauze (Oxidized Cellulose), *Ann. Surg.* 118: 116-126, 1943.
8. Putnam, T. J.: The Use of Thrombin on Soluble Cellulose in Neurosurgery, *Ann. Surg.* 118: 127-129, 1943.

thrombin in 169 operations. The tissue reactions were not altered by the use of sulfadiazine or penicillin at the same time as the fibrin foam.

Because muscle has been successfully used for over thirty years as an absorbable hemostatic agent, it seemed worth while to compare the tissue reactions due to

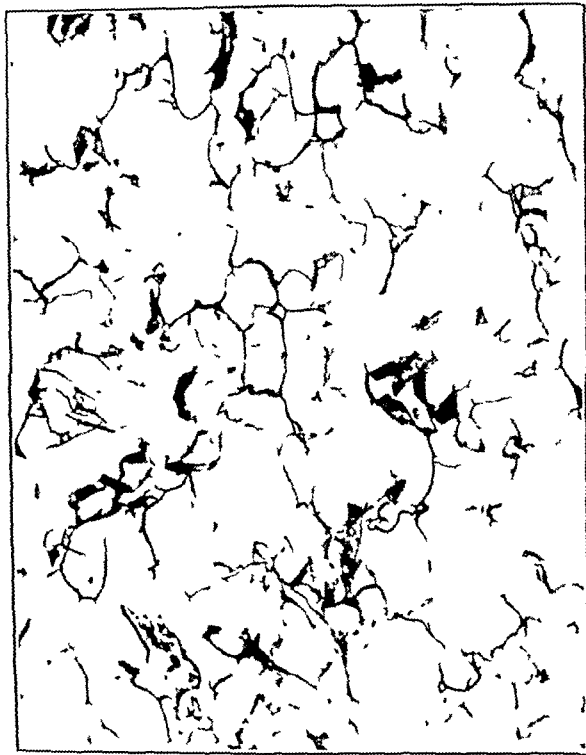


Fig. 3—The microscopic appearance of fibrin foam

muscle and those due to fibrin foam with thrombin. The experimental study of these two materials in the same monkey show conclusively that the tissue reaction to fibrin foam is very much less than that to muscle.⁶ A large mass of fibrin foam does not excite as much tissue response as one black silk suture or a bit of bone wax.

These studies indicate that the use of fibrin foam with thrombin as an absorbable hemostatic agent is safe from the standpoint of tissue reaction, even when large amounts are required.

FIBRIN FOAM WITH THROMBIN IN GENERAL SURGERY

After fibrin foam with thrombin had been given a thorough clinical trial in neurosurgery and shown to be safe by experimental and follow-up studies, possible applications in general surgery were considered. Preliminary experimentation in various sites was therefore carried out. This indicated that the tissue reactions in the liver, peritoneum, lung, kidney and abdominal wall were similar qualitatively and quantitatively to those already described in the tissues of the central nervous system. Again it appeared that large amounts of fibrin foam with thrombin were rapidly absorbed and produced so little fibrous tissue reaction that its site could be determined with difficulty or not at all when microscopic sections were studied a month or less after operation. The use of fibrin foam with thrombin as a hemostatic agent in many sites outside the nervous system was therefore considered a safe procedure.

In neurosurgery a small amount of ooze may make the difference between success of the operation and fatality. The same amount of hemorrhage in the operative fields of the general surgeon may lead to complications in wound healing but is seldom crucial in the survival of the patient. Fibrin foam with thrombin is not therefore necessary as a routine in these procedures.

There are, however, several circumstances in which large amounts of oozing occur in general surgery and in which ligature, endothermy and other conventional methods of hemostasis are inadequate. Experience with the use of fibrin foam with thrombin in these operations has as yet been limited, but the results to date indicate that it may be possible to control the hemorrhage satisfactorily with the new absorbable hemostatic agent.

One situation in which fibrin foam with thrombin has proved valuable is the cut surface of the liver. It was possible to stop the ooze from this site when it was exposed during the resection of a large carcinoma of the stomach with extension to the right lobe of the liver. Injuries to the liver might be treated in the same way. It appears that the best way to handle hemorrhage from the cut surface of the liver is to put silver clips on spurting arteries and to coat the surface with fibrin foam soaked in thrombin. The same hemostatic agent has proved of great value in controlling ooze of the gallbladder bed in cholecystectomy. While this bleeding is satisfactorily controlled by conventional methods, the completeness and rapidity of hemostasis secured by fibrin foam with thrombin facilitates the procedure considerably.

The material also controls very well the oozing in abdominal wounds when operations are performed on jaundiced patients. It is possible to cover the entire surface of the wound with this hemostatic agent, if necessary, without fear of untoward tissue reactions.

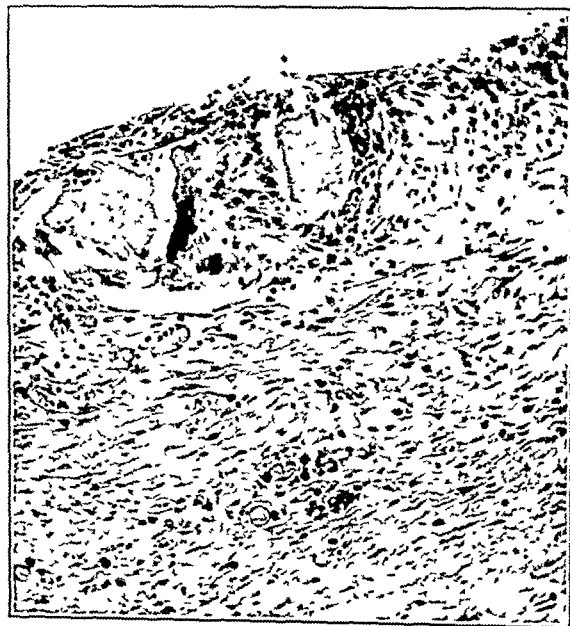


Fig. 4—The only residuum of the large mass of fibrin foam left on the surface of the dura seventeen days previously.

Persistent ooze not controlled by the usual methods of hemostasis occurs in occasional operations undertaken for a variety of conditions. Such bleeding has responded favorably to the application of fibrin foam and thrombin in seven gynecologic procedures, as well as in radical mastectomy and nephrotomy. While on a

priori grounds it would appear that fibrin foam with thrombin would be useful in many of the operations of thoracic surgery, experience thus far has been limited. One instance is of especial interest. In this case a mediastinal tumor was resected, leaving a slowly oozing bed. Application of fibrin foam with thrombin brought the bleeding promptly and completely under control.

Further clinical experience in the use of fibrin foam with thrombin as a hemostatic agent in general surgery is accumulating rapidly. Its effectiveness in a large variety of sites has been clearly demonstrated, and no contraindications to its use have thus far appeared.

FIBRIN FOAM WITH THROMBIN IN HEMOPHILIA

The prevention of hemorrhage in hemophilia has not yet been accomplished, despite numerous investigations in that direction. Surgeons faced with operations on patients suffering from that disease are confronted with a difficult problem in deciding whether it is more dangerous to forego operation or to chance the excessive bleeding which will inevitably result. This perhaps comes up more often with tooth extractions than in any other single type of procedure. When teeth are removed from patients with hemophilia, bleeding may continue for days or weeks despite packing and transfusions. It has been shown⁹ that rabbit thrombin controls such bleeding satisfactorily. Fibrin foam with thrombin has also proved to control the bleeding from the tooth sockets of patients with hemophilia quickly and completely, even when careful packing and repeated transfusions have proved ineffective.

There is considerable oozing from the tooth sockets of patients who do not have hemophilia. The packing of these tooth sockets with fibrin foam soaked in thrombin has proved of considerable value even though the serious results encountered in hemophilia were not anticipated.

Other operations in which fibrin foam and thrombin has been used to control the bleeding in hemophilic patients has been limited to the repair of a laceration of the tongue and another of the lower extremity. In each of these instances, hemostasis was prompt and complete.

SOLUTIONS OF FIBRINOGEN AND THROMBIN IN SURGERY

There are certain conditions in which it has been found advantageous to use fibrinogen and thrombin solutions rather than products manufactured from them. Cronkite, Lozner and Deaver¹⁰ have published an account of the use of these solutions in skin grafting. Experience in this clinic also indicates that these solutions are of considerable value in affixing skin grafts to the recipient sites. The grafts are placed in a solution of thrombin and the recipient site is painted with a solution of fibrinogen. When the thrombin soaked graft is laid on the prepared recipient site, a clot is rapidly formed. This acts as a glue which holds the graft in place and allows satisfactory taking.

Solutions of thrombin have also been used in otolaryngologic procedures. They are effective in controlling nasal hemorrhages in patients with leukemia as well as in those without blood diseases. The solutions may be painted or sprayed on the surface or applied by packing the nose with cotton soaked in thrombin. Solutions of thrombin are also of considerable value in securing hemostasis during tonsillectomy. While it

would be advantageous from certain points of view to use fibrin foam soaked in thrombin under these circumstances, the possibility of aspiration of bits of foam makes one hesitate to employ it except for patients who are fully conscious and have an active gag reflex or for patients under general anesthesia who are very carefully watched.

With the exception of such special situations as those discussed, hemostasis is better secured by the use of a matrix to hold the thrombin solution than it is by the solution of thrombin alone.

FIBRIN FILM IN SURGERY

It has been possible to prepare a film from solutions of fibrinogen and thrombin which are allowed to clot under conditions entirely different from those used in preparing fibrin foams.¹¹ The film is translucent, somewhat elastic and pliable. It presents physical properties which meet the requirements for a dural substitute. Experimental investigation of the use of fibrin film as a dural substitute was carried out on a series of monkeys.¹² These experiments indicated that the film was slowly replaced by fibrous tissue without the formation of meningocerebral adhesions. It thus proved a satisfactory substitute for dura under experimental conditions. The tissue reactions were not altered by the simultaneous use of sulfadiazine or penicillin.

We have used fibrin film in the repair of dura and in the prevention of meningocerebral adhesions in 59 cases. The use of the fibrin film under these circumstances has proved to be highly successful and no evidence of untoward sequelae have appeared, even though some of the patients have been followed as long as one year.

In the evaluation of a new substance for use as a dural substitute, great caution must be exercised because of the possibility of the late appearance of unfavorable reactions to its presence. In our experience so far, fibrin film has proved more satisfactory than any other material tested as a dural substitute. In addition to its safety, fibrin film is well adapted for use in the repair of dural defects because of its translucence, flexibility, ease of handling and adaptability to any contour.

It is possible that there may be applications of fibrin film to problems in general surgery. To this end, experiments have been begun to test the tissue reactions of fibrin films in joints, in the eye, in the peritoneum, about nerves and elsewhere. These applications of fibrin film are at present in the experimental stage, and the use of the material except as a dural substitute is not recommended at this time. The possibility of unfavorable reaction to fibrin film in general surgery must be borne in mind and each site thoroughly investigated experimentally before it is used in the clinic.

SUMMARY

The preparation of purified human fibrinogen and thrombin has made possible new materials for use in surgery. The solutions of the proteins may be employed and a variety of products prepared by combining them under different conditions.

Of these, fibrin foam with thrombin is a new absorbable hemostatic agent prepared from fibrinogen and thrombin of human blood plasma.

9. Lozner, E. L.; MacDonald, H.; Finland, H., and Taylor, F. H. L.: The Use of Rabbit Thrombin as a Local Hemostatic, *Am. J. M. Sc.* 202: 593-598, 1941.

10. Cronkite, E. P.; Lozner, E. L., and Deaver, J. M.: Use of Thrombin and Fibrinogen in Skin Grafting, *J. A. M. A.* 124: 976-978 (April 1) 1944.

11. Ferry, J. D., and Morrison, P. R.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation; XVII. Fibrin Clots, Fibrin Films, and Fibrinogen Plastics, *J. Clin. Investigation* 23: 566-572, 1944.

12. Bailey, O. T., and Ingraham, F. D.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation; XXII. Fibrin Films in Neurosurgery with Special Reference to Their Use in the Repair of Dural Defects and in the Prevention of Meningocerebral Adhesions, *J. Clin. Investigation* 23: 597-600, 1944. Bailey and Ingraham.

Extensive clinical use of fibrin foam with thrombin in neurosurgical operations has shown it to control oozing from the dura, from beneath bone flaps and from the cerebral tissues as well as from the dural sinuses and large veins. It is not recommended for brisk arterial hemorrhage.

The tissue reaction to fibrin foam with thrombin is minimal and negligible from the clinical standpoint. In this respect, as well as in availability, ease of manipulation and adaptability, it is much superior to muscle. Fibrin foam with thrombin is prepared wholly from materials of human origin.

This hemostatic agent can be used with advantage in certain procedures by the general surgeon. It is also effective in controlling hemorrhage in patients with hemophilia.

A limited use has been made of solutions of fibrinogen and thrombin in certain special situations in which it is desirable to form a clot *in situ*.

Fibrin film is a homogeneous sheet prepared from human fibrinogen and thrombin. It has proved effective in the repair of dural defects and in the prevention of meningocerebral adhesions.

300 Longwood Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. JANEWAY AND DRs.
INGRAHAM AND BAILEY

DR. ORVILLE T. BAILEY, Boston: There has been an inclination, because of the nature of most investigations on purified proteins, to regard them as unstable substances, but the preparations of albumin may be frozen, thawed and injected clinically without causing reactions. They may be kept at tropical temperatures for periods of many months, and severe shaking does not change them in such a way that they cause reactions in patients when injected subsequently. A number of hospitals have sent the tissues of patients receiving large amounts of albumin to learn whether there are any pathologic effects which may be due to the presence of the administration of such an unusual amount of one fraction of human plasma. Pathologic changes which could be correlated with the injection of the albumin could not be found. Since fibrin foam, to be effective, must be left in place, it should elicit a minimal tissue reaction and this is found to be the case. Fibrin foam, when it is fixed directly, consists of cross sections of the honeycombs of which it is composed. When it has been left on the surface of the dura for fourteen hours the meshes of the honeycomb have become filled with blood clot. There is practically no cellular infiltration in response to its presence. At the end of twenty-four days a large mass of fibrin foam has become reduced to a small structure, filling only a high power field, and is surrounded by a minimal amount of connective tissue. It is difficult to make sure that even this small amount of connective tissue is due wholly to the presence of the fibrin foam, because the blood clot which the fibrin foam is left in place to produce will usually result in the production of more fibrous tissue than that. Experiments were set up in monkeys to compare the tissue reaction of muscle and fibrin foam as hemostatic agents. The material was introduced into the cerebral cortex. At the end of four weeks there is practically no reaction to the presence of the fibrin foam. It has become somewhat coalesced and is nearly absorbed. When a piece of muscle of similar size is left in a comparable place on the opposite side of the same animal there is considerable gliosis about the fragment, and the muscle is being converted into a mass of richly collagenous connective tissue. Some of the blood vessels which were present in the original fragment of the muscle are still present. This indicates that the reaction to fibrin foam is many times less than it is to muscle, and this permits us to use fibrin foam in a great many situations where we might fear tissue reaction from muscle.

A STUDY OF "PENICILLIN FAILURES"

ARTHUR L. BLOOMFIELD, M.D.

WILLIAM M. M. KIRBY, M.D. .

AND

CHARLES D. ARMSTRONG, M.D.

SAN FRANCISCO

In studying a new therapeutic agent it is necessary not only to discover the conditions in which it is effective but also to define the circumstances under which it fails or at least yields unsatisfactory results. Penicillin has now been used long enough to make possible the compilation of lists of those infections in which it seems to be of value.¹ But such bare enumerations do not begin to tell the story, as there are all sorts of special circumstances which arise in the individual case to modify any general statement. From an intensive study of over 100 patients treated with penicillin a good deal has been learned about what might be called "penicillin failures"; it is with this phase of the subject that the present paper is concerned.

"Penicillin failures" may be discussed under the following headings:

1. Causes of death in penicillin treated patients.
2. Failures due to inadequate amounts of penicillin.
3. Failures due to inadequate surgical drainage in penicillin treated cases.
4. Failures due to overwhelming infection even when penicillin dosage was presumably adequate.
5. Failure to prevent or cure renal lesions in penicillin treated cases of streptococcal infection.
6. Conditions in which penicillin either fails or is likely to be inadequate.

1. CAUSES OF DEATH IN PENICILLIN TREATED CASES

Aside from patients who were not seriously ill, such as those with primary syphilis, mild sulfonamide fast gonorrhea or furunculosis, we have treated 87 instances of severe infection including endocarditis, meningitis and acute osteomyelitis. An idea of the general character of the material is obtained from the fact that 27, or 31 per cent, of these patients had bacteremia. Of this series of 87 patients 7, or 8 per cent, died. An analysis of these fatal cases is given in the accompanying table. It appears that only 2 deaths (cases 6 and 7), or 2.3 per cent of the whole series, could be ascribed to actual failure of penicillin treatment. Ten years ago one would have had a mortality of at least 50 per cent.

2. FAILURES DUE TO INSUFFICIENT PENICILLIN THERAPY

It is not our present purpose to discuss the unsettled question of adequate penicillin dosage. Excellent results have been reported with relatively small quantities of the material,² but this does not rule out the need of larger doses in some cases. At any rate the unsatisfactory results in the following patients seemed to be ascribable to too small amounts of penicillin or to treatment of too brief duration.

From the Department of Medicine, Stanford University School of Medicine.

The Penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigations recommended by the Committee on Chemotherapeutics and Other Agents of the National Research Council.

1. Memorandum of Office of Civilian Penicillin Distribution, Chicago, May 1944.

2. Herrell, W. E.: The Clinical Use of Penicillin, an Antibacterial Agent of Biologic Origin, *J. A. M. A.* 124: 622 (March 4) 1944.

The following case concerns relapse of an infection which probably could have been prevented by more prolonged treatment of the original attack, although the daily dose seemed adequate:

CASE 8—A woman aged 61 entered the hospital on the fifth day of a typical facial erysipelas. The eruption extended over the nose to the malar prominences and ordinarily would have continued to spread for several days. She was given an intravenous dose of 35,000 units of penicillin and thereafter

seems clear that with any serious infection it may be well to continue treatment for several days after the process has been controlled as possible insurance against recurrence. This applies especially to staphylococci and streptococci infections. In *Streptococcus viridans* subacute bacterial endocarditis the good results which we have obtained in a consecutive series of 9 cases seems due to the continuation of uninterrupted treatment over a period of six to eight weeks. Recurrences of acute

Patients Who Died Under Penicillin Treatment

Case	Clinical Diagnosis	Treatment	Anatomic Diagnosis	Comment
1	Lung abscess following aspiration of potato chip, 4 week ⁴ duration; high fever; abscess at least 15 cm in diameter; huge amount of foul sputum containing various streptococci and putrefactive anaerobes; a desperately ill patient with progressive gangrene of lung, with diabetes of moderate severity	Penicillin by continuous intravenous drip, 300,000 units per day; after 3 days with condition generally better she died suddenly in acute collapse	A huge lung abscess occupying practically the entire right upper lobe was found; there was no evidence of air embolus, no pulmonary embolus, no edema of lungs; in short, no anatomic cause of death was found	Contents of abscess obtained at autopsy showed no growth on culture, so that the penicillin had been effective to some extent, treatment had not gone on long enough before she died to draw any further conclusions as to efficacy; no cause for sudden death was found; the lots of penicillin used in this case gave no reactions in other patients, and penicillin clearly had nothing to do with her death
2	A patient in the last stages of lymphoid leukemia developed acute lobar pneumonia of left lung with 150 colonies per cubic centimeter of type 1 pneumococcus	Treatment started on fifth day of disease, 200,000 to 300,000 units by continuous intravenous drip; rapid improvement and 12 days later when apparently convalescent went into collapse with high fever and died in 24 hours	The pneumonia on the left was practically resolved; there was a fresh consolidation of the right middle lobe, which showed no pneumococci but an unidentifiable bacillus; extensive lesions of leukemia	A dying leukemic woman with terminal type 1 pneumococcal sepsis with heavy bacteremia and lung consolidation was cleared of her pneumococcal infection but died of leukemia and another different (bacillary) infection
3	A young man with a fistula from esophagus to lung and huge paravertebral abscesses from which non-hemolytic streptococci (sensitive to penicillin) were grown; no tubercle bacilli found on extensive search of pus and sputum	Intensive intravenous, intramuscular and local penicillin therapy for about a month	Huge tuberculous paravertebral abscesses; tubercle bacilli easily demonstrated in scrapings from granulation tissue	A misdiagnosis. This patient would not have been treated had the correct diagnosis of tuberculosis been made
4	A man aged 46 had pneumococcal sepsis with 25 to 50 colonies of type 25 pneumococcus per cubic centimeter of blood; there were evidences of endocarditis, arthritis and meningitis	Intensive treatment of up to 400,000 units daily by intravenous drip, also intrathecal penicillin; treatment over a period of 3 weeks eliminated all evidence of pneumococcal infection (sterile blood and spinal fluid cultures) but he developed a huge bed sore with general failure and died	No autopsy.....	There was every evidence here that the pneumococcal sepsis was cured; death was clearly due to infection from a huge bed sore and perhaps could have been avoided
5	A woman aged 22 was desperately ill with a gas bacillus infection following attempted abortion (<i>Clostridium welchii</i> grown from cervical discharge)	After 5 days of intensive penicillin therapy by intravenous drip the gas bacillus infection was entirely cleared; she was oliguric on entry and went on to uremia and anuria of obscure origin—possibly associated with transfusion or sulfonamides received before entry	All evidences of uterine infection cleared up; kidneys showed a peculiar diffuse lesion—still under study	<i>C. welchii</i> infection cleared under penicillin, but she died of renal disease which was already under way when treatment was started
6	A woman aged 39 with old rheumatic mitral disease infected her finger by pin prick and developed <i>Staph aureus</i> bacteremia, 800 colonies per cubic centimeter; she seemed moribund with jaundice, high fever and anemia; the staphylococcus was highly sensitive to penicillin in test tube	Given penicillin by intravenous drip at rate of 300,000 units in first 20 hours; at this time blood culture (with penicillinase) still positive—130 colonies per cubic centimeter—no growth without penicillinase, indicating a high blood level; progressive cyanosis and dyspnea; death 24 hours after entry	Old mitral lesion with fresh acute ulcerative endocarditis; no special cause of death found	This case must be considered a penicillin failure; in spite of intensive treatment and high blood level, bacteremia was not controlled soon enough and she died in toxemia
7	A man aged 59 was in hospital for nearly 5 months with recurring <i>S aureus</i> sepsis	Received a total of 7,500,000 units of penicillin	Subacute pericarditis, subacute meningitis, small abscesses in kidney	This case also must be set down as penicillin failure, although it is now believed that his treatment was inadequate in amount

15,000 units intramuscularly every three hours. There was no further spread of the process, and within twenty-four hours it seemed to have completely subsided. The temperature dropped promptly (fig. 1) and penicillin was continued for only two days—a total of 255,000 units. Three days later she left the hospital apparently well but after an interval of seven days returned again with typical facial erysipelas. This was clearly a second attack and not a residue of the first. Penicillin was given once more with prompt arrest of the erysipelas, but this time treatment was continued for nine days—a total of 1,180,000 units (fig. 1).

There is every reason to believe that the second attack would not have occurred had treatment been continued for a longer time after the first bout. It

hemolytic streptococcus throat infections, common with brief treatment,³ can be prevented by giving penicillin over a period of five to ten days.

In the next case also the poor result may be due to the fact that treatment was stopped too soon:

CASE 9.—A school boy aged 8 years was admitted on the third day of an acute osteomyelitis of the left femur. The left thigh was hot, red, greatly swollen and acutely painful. There was high fever with leukocytosis, and a blood culture was positive for *S. aureus*. Penicillin was started on the following (fourth) day in doses of 150,000 units per day by continuous intravenous drip. Treatment was continued for only twelve days and was then stopped, although the temperature

3 Rantz, L. A.: Personal communication to the authors

had not yet reached normal (fig. 2). A roentgenogram on entry showed no visible lesion in the bone, but on the thirteenth day of the disease an early destructive process was detected by x-ray just proximal to the epiphyseal line of the lower femur. No periosteal reaction was seen at this time. The patient left the hospital on the twenty-fourth day of the disease

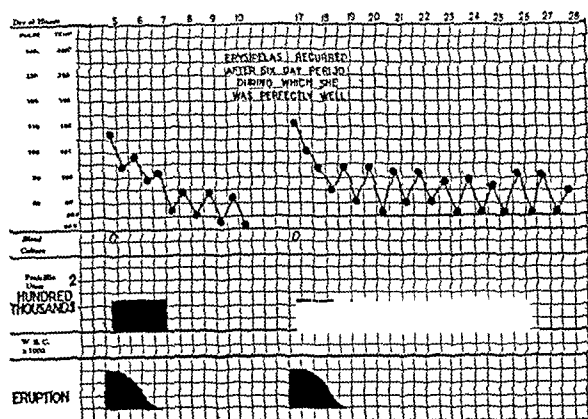


Fig 1.—Graphic record of case 8

with normal temperature, no pain and only very slight swelling of the leg just above the left knee. Frequent roentgenograms from this time on showed progressive destruction and absorption of the lower two thirds of the femur and a pronounced periosteal reaction throughout its length. After three months there was obvious sequestration and finally a pathologic fracture. X-ray films made on the thirteenth day and at the height of the lesion several months later are shown in figures 3 and 4

Our experience in 8 cases of acute osteomyelitis of the long bones in which no operation was done indicates that very intensive and prolonged therapy is necessary if serious changes are to be prevented. Even then, as reported by others also, the x-rays from the second week on usually show some absorption of cortex with periosteal reaction possibly due to injury which began before penicillin therapy was started. Some staphylococci must be sealed in and difficult to reach in areas made relatively avascular by thrombosis and necrosis. It is possible, if not probable, that more prolonged therapy of patient 9 might have arrested the process at an earlier stage as it appears to have done

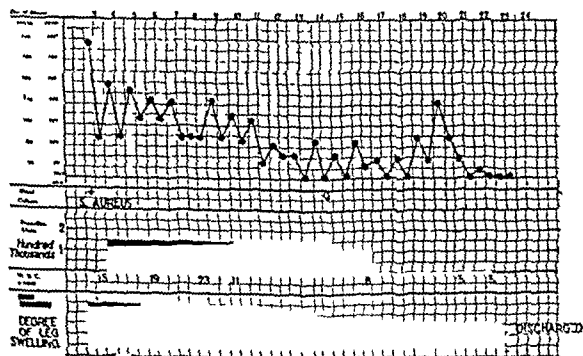


Fig. 2.—Graphic record of case 9

in our other cases. At any rate prolonged uninterrupted treatment is clearly indicated in acute osteomyelitis. This whole subject will be dealt with in detail in another paper.

In case 7 in the table it is our belief that death might have been prevented by more intensive and continuous therapy.

This man, with severe diabetes, developed *S. aureus* sepsis with positive blood culture following a skin injury. On entry there were skin lesions and osteomyelitis of the left humerus. Pericarditis was detected (friction rub) a few days later. He was one of our early cases and after ten days of penicillin (2,000,000 units) treatment was arbitrarily stopped. Over a period of five months there were repeated episodes of *S. aureus* infection of various structures with recurring positive blood culture, although the organism was always sensitive to penicillin in vitro. Treatment with penicillin, given during each exacerbation, in the end totaled 7,500,000 units but was never continued over a period of more than ten days at a time. The patient finally left the hospital feeling fairly well, with normal temperature and with no obvious foci, but on reaching home he again developed fever with left upper abdominal pain, failed rapidly and died in twelve days. At autopsy pertinent points were "subacute and chronic pericarditis, subacute and chronic myocarditis, subacute meningitis, small abscesses of kidney." There were also large infarcts of the spleen



Fig 3—Left femur in case 9 on December 20, the thirteenth day of disease, showing early absorption and periostitis.

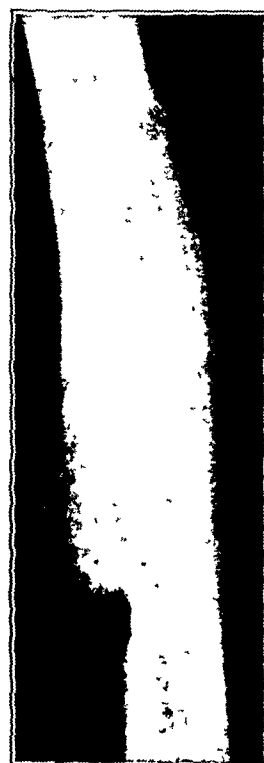


Fig. 4—Left femur in case 9 on April 4, showing advanced changes with sequestration and pathologic fracture.

This patient furnishes a typical example of penicillin therapy which during a long relapsing infection always fell short of the mark. It seems probable from experience in subsequent cases that intensive uninterrupted treatment over a period of four to six weeks would have cured this man. The hazard of too little and too brief therapy, which in our experience is especially great with staphylococcal infections, is illustrated.

3. FAILURES ASSOCIATED WITH PENICILLIN THERAPY WHEN ADEQUATE SURGICAL DRAINAGE OF INFECTIONS WAS NOT CARRIED OUT

In spite of the great efficacy of penicillin in controlling certain types of infection, the principle that evacuation of closed collections of pus is necessary for rapid cure still holds good in most cases.⁴ Simple

⁴ Keefer, C. S., and others. Penicillin in the Treatment of Infections, J. A. M. A. 122:1217 (Aug 28) 1943.

aspiration of pneumococcal empyema⁵ and of gonococcal joints, with injection of penicillin, has, to be sure, been adequate in many cases, but with other infections, especially those due to staphylococci and nonhemolytic streptococci, progress may be arrested until surgical drainage has been instituted. The problem is illustrated by the following cases:

CASE 10.—A man aged 38 developed subphrenic abscesses probably following perforation of a viscus. The abscesses were incised and drained and an anaerobic nonhemolytic streptococcus,

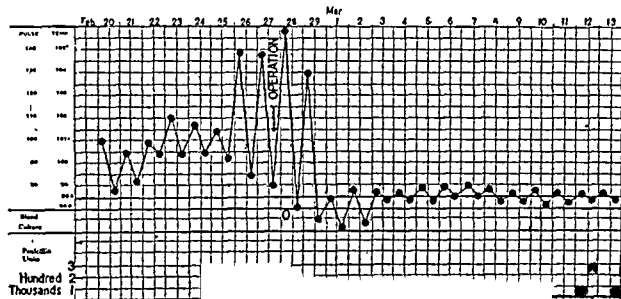


Fig. 5.—Graphic record of case 10.

cus, highly sensitive to penicillin, was isolated. He received intensive penicillin therapy (2,290,000 units) by continuous intravenous drip, as well as locally, for eleven days. His temperature gradually fell almost to normal and he seemed much better, but fever recurred with leukocytosis and abdominal pain. It was evident that there was more pus, and drainage of an encapsulated pocket was done through the previous incision. Penicillin (1,515,000 units) was given intramuscularly over a period of eleven days and the temperature again fell to normal with clinical improvement. He was not entirely well, however, and fever soon returned. This time x-rays showed a lung abscess which appeared to have developed under penicillin therapy. The same organism obtained from the subphrenic abscess was grown from the lung lesion, which was drained surgically. Another intramuscular course of 1,000,000 units was given with injection of 26,000 units into the abscess cavity. There was now rapid healing of all lesions, and the patient was discharged well after a hospital stay of three months and a total of 7,400,00 units of penicillin. Figure 5 shows the portions of the course before and after drainage of the lung abscess. One sees that in spite of intensive penicillin the temperature did not drop until drainage was instituted.

The streptococcus in this case was highly sensitive to penicillin in vitro, but the whole situation is difficult to evaluate. Those who saw him felt that he did better than patients of this sort usually do with surgery alone. On the other hand there were two relapses in spite of intensive penicillin treatment, each associated with an undrained collection of pus.

The following case is even more clearcut:

CASE 11.—A man aged 66 was brought to the hospital with the story of sudden onset of sharp pain in the right side of the chest two weeks previously. This had continued with fever, prostration and general failure. There had not been cough, sputum or any suggestion of bronchitis or pneumonia. On entry he looked ill and had sweats and fever. There were signs of fluid in the right chest and, on tapping, thin yellow purulent fluid was obtained. It had an extremely foul odor. Smears showed innumerable bacteria and on culture nonhemolytic streptococci and an unidentified gram positive bacillus were grown. Between April 13 and April 29 the chest was aspirated seven times, and on five occasions penicillin was injected into the pleural cavity in amounts of 50,000 to 100,000 units, a total of 495,000 units. There was considerable improve-

ment under this program, and by the 29th the fluid was no longer foul and no organisms were seen or grown. However, 50 cc. of yellow thickish pus was obtained and the patient continued to feel ill and to have a variable fever with leukocytosis. On April 27 (fig. 6) penicillin was started intramuscularly at the rate of 120,000 units daily in eight doses, but after five days there was no improvement so that operation was finally done, a tube inserted into the pleura and tidal drainage instituted. The temperature promptly fell to normal. The patient recovered rapidly and left the hospital well on May 20.

In this case thoracentesis with local injection of penicillin led to partial control of the infection and did away with the foul nature of the pus. However, no complete clearing could be obtained until a tube was inserted for continuous tidal drainage. This has been our general experience in other instances of streptococcal and staphylococcal empyema.

4. FAILURES DUE TO OVERWHELMING INFECTION

Patient 6 in the table is the only example we have had of failure of penicillin due simply to an overwhelming infection with an organism sensitive in vitro. She received large doses of penicillin by continuous intravenous drip, sufficient to raise the blood content to well over the standard bacteriostatic level of 0.15 unit per cubic centimeter.⁶ In spite of this the blood stream was not cleared and after twenty hours culture still yielded 130 colonies of *S. aureus* per cubic centimeter. The importance of using penicillinase⁷ is also brought out, as there was enough penicillin in the blood to inhibit growth in a blood culture made without penicillinase.

5. FAILURE TO PREVENT OR CURE THE DEVELOPMENT OF GLOMERULAR NEPHRITIS IN CERTAIN PATIENTS WITH STREPTOCOCCIC INFECTIONS TREATED WITH PENICILLIN

The association of glomerulonephritis with certain types of streptococcal infection is clearly established. When penicillin became available it seemed of particular importance to find out if this agent, which extirpates so many streptococcal infections with great speed, would prevent the occurrence of nephritis. Of no less interest was the question of whether nephritis

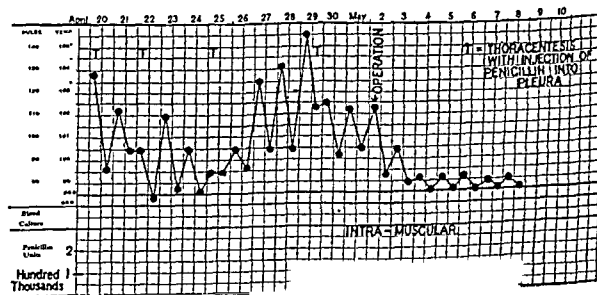


Fig. 6.—Graphic record of case 11.

already established would clear up after elimination of concomitant streptococcal infection by penicillin, as for example in bacterial endocarditis.

CASE 12.—A man aged 66, some time after a burn of the left shoulder, was brought to another hospital because of high fever, shortness of breath and swelling of the left leg. Blood culture was found positive for hemolytic streptococci but in spite of intensive sulfadiazine therapy and two transfusions

5. Tillett, W. S.; Camber, M. J., and McCormack, J. E.: The Treatment of Lobar Pneumonia and Pneumococcal Empyema with Penicillin, *Bull. New York Acad. Med.* 20:142, 1944.

6. Rammelkamp, C. H., and Keefer, C. S.: Penicillin: Its Antibacterial Effect in Whole Blood and Serum for the Hemolytic Streptococcus and Staphylococcus Aureus, *J. Clin. Investigation* 22:649, 1943.
7. Kirby, W. M. M.: Extraction of a Highly Potent Penicillin Inactivator from Penicillin Resistant Staphylococci, *Science* 89:452, 1944.

he had gone steadily downhill. On entry to Stanford Hospital (fig. 7) he seemed desperately ill. The temperature was 40.5 C. (104.9 F.). The remains of a small burn on the right shoulder were visible but the lesion was almost healed. There were many petechiae, a faint systolic murmur at the apex and soft edema of both ankles, but the left leg was much more swollen than the right. Blood culture yielded 400 colonies per cubic centimeter of hemolytic streptococci. He was moderately anemic and the blood urea was 90 mg. per hundred cubic centimeters. The urine contained considerable protein, immense numbers of red cells, white cells and casts of all sorts. The

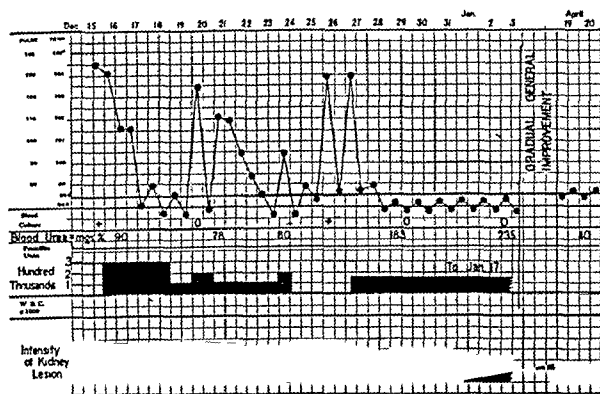


Fig. 7.—Graphic record of case 12.

diagnosis was sepsis, hemolytic streptococcus, with bacteremia, phlebitis of the left femoral vein, and acute glomerular nephritis associated with the streptococcal infection. Penicillin was given by continuous intravenous drip at the rate of 300,000 units per day, and within twenty-four hours the blood culture showed no growth and the temperature fell abruptly to normal. On the fifth day there was an unexplained rise of temperature, which may have been due to a small pulmonary embolus. Penicillin was stopped on the ninth day with the temperature normal and the patient much improved, but the urine was essentially unchanged and the blood urea was still 78 mg. per hundred cubic centimeters. Two days after penicillin was stopped he had a chill with rise of temperature to 40 C. (104 F.) and blood culture was again positive, showing 5 colonies of hemolytic streptococci per cubic centimeter. Penicillin was given again, intramuscularly, for three weeks. The temperature fell promptly to normal and never rose again above 37.5 C. (99.5 F.) nor was the blood culture again positive.

In spite of the elimination of the streptococcal infection the nephritis seemed unaffected. The urine continued to show protein, large numbers of red cells and casts. The blood urea rose as high as 235 mg. per hundred cubic centimeters. Soft edema continued. His general condition gradually improved, so that by May 1944, four months after leaving the hospital, he felt very well and the blood urea was only 40 mg. per hundred cubic centimeters. The blood pressure was 150/85. Except for slight pitting, edema had disappeared. The urine, however, showed the typical findings of a glomerular nephritis in the subacute stage. An Addis count gave protein 0.35 Gm. in twenty-four hours, red blood cells 250 million in twenty-four hours, white and epithelial cells 55 million in twenty-four hours and casts 500,000 (granular, hyaline and a few blood casts). This case also illustrates relapse of an acute infection with recurrence of positive blood culture when penicillin was stopped too soon.

There is every reason to believe that this patient's streptococcal infection was completely eliminated. There is no evidence, however, that the course of the nephritis was influenced and every reason to believe that an irreversible lesion has been set up which will progress in the usual relentless fashion of chronic glomerulonephritis.

Similar observations by one of us (C. D. A.) in cases of *S. viridans* bacterial endocarditis have shown that the renal lesion may persist after the infection has been eliminated. All this is in harmony with the evidence accumulated by Addis⁸ to the effect that glomerular nephritis, once under way, tends to propagate itself.

6. CONDITIONS IN WHICH PENICILLIN EITHER FAILS OR IS LIKELY TO BE INADEQUATE

Pneumococcal Meningitis.—Although pneumococci are often highly sensitive to penicillin, the results of treatment of pneumococcal meningitis have in our hands been unsatisfactory in many ways. These poor results are doubtless attributable in some degree to the nature of this infection⁹ with its well known tendency to adhesive arachnoiditis, encephalitis and thick gelatinous exudate, which impedes the local application of any therapeutic agent. Three patients with pneumococcal meningitis, probably of otitic origin, all survived their infection after intensive penicillin treatment given intrathecally, by injection into the ventricles and by intramuscular or intravenous injection, but in each instance serious neuropsychiatric residues reduced them to an essentially vegetative state. The following case is typical:

CASE 13.—A man aged 48, a gardener, was found comatose in his home two days before entry. He had previously been well. He was found to have signs of meningitis, and type 12 pneumococcus was grown from the blood and spinal fluid. He failed to improve on intravenous sulfadiazine and antipneumococcus serum and was sent into Stanford Hospital for penicillin. He was flushed, restless and delirious. The neck was stiff. There was some pus in the left auditory meatus but there were no signs of mastoiditis. He was started on large doses of penicillin by continuous intravenous drip, later changing to the intramuscular route (200,000 units per day). He also received 10,000 units in 10 cc. of saline solution intrathecally almost daily for the first eight days. On the ninth day, as he had not improved, the ventricles were tapped but there was no evidence of block. His temperature gradually subsided over twenty-six days, but the spinal fluid still showed cells and protein. After eleven days there was a relapse with slight fever and considerable disorientation, but pneumococci were not recovered from the spinal fluid. However, he was given more penicillin intramuscularly and four intrathecal injections of 5,000 units each. He remained mildly confused and had a peculiar visual difficulty characterized by ability to see objects but difficulty in naming them. He could read words aloud but could not read consecutively or understand what he read. At the time he left the hospital, two months after entry, the spinal fluid still showed increased cells and protein suggestive of arachnoiditis, but he was much improved. The temperature was normal. He was oriented and talked rationally for the most part. There was still a pronounced personality change with general mild mental deterioration. Six weeks after leaving the hospital there was not much change.

Poor results in this small series of cases should not be taken as a final evaluation of penicillin in pneumococcal infections and better results have been reported by others.¹⁰ However, our cases were treated intensively, both intrathecally, by ventricular puncture and by the intravenous and intramuscular routes and it seems unlikely that the outcome was due to too little treatment. Since sulfonamides are quite effective in pneumococcal meningitis, it may turn out that sulfonamides together with penicillin may be the best treatment for this condi-

8. Addis, T.: Unpublished observations.

9. Rueggsegger, J. M.: Pneumococcal Meningitis, *Ann. Int. Med.* 17: 693, 1942.

10. Dawson, M. H., and Hobby, G. L.: The Clinical Use of Penicillin. Observations in 100 Cases, *J. A. M. A.* 124: 611 (March 4) 1944.

tion. It seems especially important that some of our cases did not come under treatment until late in the disease. In the long run better results will undoubtedly be obtained if penicillin therapy is started on the first or second day of the meningitis.

Chronic (Staphylococcic) Osteomyelitis.—In contrast to acute staphylococcic osteomyelitis our results in most of the chronic cases have been unsatisfactory. If the lesion is in a long bone and can be laid wide open by surgical means, local penicillin irrigations seem to aid in rapid healing. In cases with sinuses leading into the pelvic bones or into the spine and inaccessible to surgery, neither local irrigations nor heavy intramuscular injections have had any definite effect in our hands.

CONDITIONS IN WHICH PENICILLIN WAS ENTIRELY INEFFECTIVE

During the course of our work penicillin was used in infections occurring along with other diseases, thus giving an opportunity to evaluate the material in conditions in which it ordinarily would not be used. The results agree with those obtained by others¹ but may be enumerated:

Tuberculous paravertebral abscess, no effect.

Lymphoid leukemia, no effect.

Aleukemic myeloid leukemia, no effect.

Infectious mononucleosis, no effect. (This condition developed in a patient with acute osteomyelitis while under active penicillin treatment.)

Mycosis fungoides, no effect.

Chronic (rheumatoid) arthritis, no effect.

Filariasis, no effect. (Blood count of microfilariae remained unchanged during penicillin administration.)

RELATION OF PENICILLIN FAILURE TO SENSITIVITY OF STRAINS IN VITRO

Even within categories of bacteria such as streptococci, staphylococci and others which are in general sensitive to penicillin there may be strains which are resistant in vitro. It is important to know whether such strain resistance in the test tube runs parallel with resistance to therapy in disease. It has been noteworthy that practically all of our strains of pneumococci, streptococci and staphylococci recovered from clinical cases of active infection were inhibited in the general range of 0.1 unit per cubic centimeter of culture medium. The relations with staphylococci are quite complicated and are discussed in detail in other papers from this clinic;¹¹ most of our penicillin resistant strains of this organism were recovered from sources other than active infections. There are strong suggestions, however, that some correlation exists between strain sensitivity in vitro and clinical response. This is well brought out in our series of 10 cases of subacute bacterial endocarditis caused by nonhemolytic streptococci. Eight strains were highly sensitive to penicillin in vitro, and all of the patients infected with these were promptly rendered bacteria free. In 1 of them culture made only two hours after penicillin was started was negative, as were all subsequent cultures. In the ninth case a strain was obtained which required two or three times the usual concentration of penicillin to produce inhibition in the test tube and with this patient intensive (200,000 to 300,000 units per day) treatment was carried on for nineteen days before the temperature began to fall, although blood cultures were

negative after penicillin was given. The strain from the tenth case was not inhibited in vitro even with very high concentrations of penicillin, and this patient failed to respond clinically to doses as high as 450,000 units per day, while blood cultures remained consistently positive.

It is evident, therefore, that failure of therapy in an individual case may be due to strain resistance, and the need of in vitro tests in routine work is emphasized.

We have not so far encountered the phenomenon of a strain becoming penicillin fast during the course of treatment, although this possibility has been raised both on experimental and on clinical grounds.¹² In a case of relapsing staphylococcic sepsis, for example, many positive blood cultures over a period of five months yielded organisms which were all equally sensitive even though treatment had been inadequate. It does not seem probable that induced penicillin fastness will turn out to be a major factor in clinical penicillin failures.

COMMENT

Penicillin failures fall under two main headings: First there are those diseases or infections which are entirely unaffected by penicillin. Those are now pretty well known and are enumerated in the memorandum¹ of the Office of Civilian Penicillin Distribution. Secondly there are the infections which in a general way are amenable to penicillin but in which special circumstances may lead to failure in the individual case. The present analysis deals with this problem.

Patients with infections by bacteria which are sensitive to the actions of penicillin may die or may relapse because of inadequate dosage. The daily amount may be too small, but the time factor is likely to be more important. This is clearly established in *S. viridans* bacterial endocarditis, and in hemolytic streptococcus and staphylococcus infections. A daily dose which may be adequate if given over periods of weeks or months may fail to cure if given for a few days only, even though the infection seems at first to be eliminated. We believe that the question of optimum dosage both as to frequency and as to size of daily injections and as to total duration of treatment is the most important practical problem in penicillin therapy at the present time.

The question of whether collections of pus can be disposed of by aspiration and injection of penicillin without surgical drainage is also one of great importance. In general the position seems secure that such surgical drainage will be necessary in addition to penicillin. This applies, in our experience, to empyema, lung abscess, subphrenic abscess and brain abscess, even though certain local collections caused by specially sensitive organisms (gonococci, pneumococci⁵) and located in favorable situations may be cured by aspiration and injection alone. Ordinarily if such a lesion is not cured or definitely improving after a week of injection therapy surgical drainage should be done. In some cases surgery is obviously necessary when the patient is first seen.

Penicillin may fail in infections with a highly sensitive organism even when given in huge doses. Under these circumstances either the patient is seen in a late stage of the disease or there is an overwhelming infection.

11. Rantz, L. A., and Kirby, W. M. M.: The Action of Penicillin on the Staphylococcus in Vitro, to be published. Kirby, W. M. M.: Bacteriostatic and Lytic Actions of Penicillin on Sensitive and Resistant Staphylococci, to be published.

12. McKee, C. H., and Houck, C. L.: Induced Resistance to Penicillin of Cultures of Staphylococci, Pneumococci and Streptococci, *Proc. Soc. Exper. Biol. & Med.* 53: 33, 1943. Rammelkamp, C. H., and Maxon, T.: Resistance of Staphylococcus Aureus to the Action of Penicillin, *ibid.* 51: 386, 1942.

In general elimination of streptococcic infections by penicillin will not be followed by healing of an associated nephritis. In certain conditions, such as pneumococcic meningitis, the nature of the lesions makes adequate application of penicillin difficult, and serious neuropsychiatric sequelae are likely to result even if the infection is overcome and the patient lives. Chronic staphylococcic osteomyelitis of the spine or pelvic bones not amenable to wide surgical exposure has in our experience not been influenced by penicillin even though the strains are sensitive in vitro.

SUMMARY

Penicillin failures for the most part fall into the following groups:

1. Cases in which the treatment is too brief or the daily dose too small.
2. Cases in which penicillin fails unless surgical drainage is also done.
3. Overwhelming infection, even with a sensitive strain.

Penicillin may fail to prevent the development or progress of nephritis even if the predisposing (streptococcic) infection is eliminated.

Penicillin treatment of pneumococcic meningitis may be followed by chronic neuropsychiatric disturbances.

There is probably a correlation between strain sensitivity in vitro and clinical amenability to penicillin therapy.

Development of penicillin fastness probably plays little part in therapeutic failures.

THE TOXIC REACTIONS OF THE
NEWER SULFONAMIDES

CARL F. VILTER, M.D.

AND

M. A. BLANKENHORN, M.D.

CINCINNATI

In the past four years 1,936 patients in the medical wards at the Cincinnati General Hospital have been treated with sulfathiazole, sulfadiazine, sulfapyrazine, sulfaguanidine and succinylsulfathiazole. Sulfapyridine is now considered obsolete and is no longer used in this service, sulfanilamide is rarely employed and only a preliminary report can be given on sulfamerazine, since its use has been recent.

This particular study was undertaken to determine the relative incidence of untoward reactions to the various drugs and the relation of the mild and readily recognizable symptoms to severely toxic or lethal reactions. Difficulties were encountered in this evaluation because many patients admitted to this service are critically ill as the result of acute infection or are in a moribund state of chronic disease, and thus the division of symptoms due to drug and those due to disease is difficult. Also the drug is usually discontinued at the first sign suggestive of sulfonamide toxicity. Consequently the course from early and mild to late and severe symptoms can rarely be followed.

Table 1 shows the relative incidence of toxic reactions and of deaths due to and contributed to by sulfonamides. Persons treated at home and sent to the

hospital because of toxic symptoms are excluded, since this would yield an erroneous incidence of toxicity. Untoward symptoms caused by sulfadiazine are significantly less than those due to sulfathiazole and sulfapyrazine.

The symptomatology deserves some description and comment. Although the incidence may vary between one sulfonamide and another, the clinical picture is

TABLE 1.—Incidence of Toxic Reactions to Sulfonamides in the Medical Wards of the Cincinnati General Hospital, January 1940 to April 1944

	Patients Treated	Patients Who Developed Toxic Reactions *	Per Cent	Deaths Due to Drug Intoxi- cation *	Deaths in Which Drugs Con- tributed
Sulfathiazole.....	1,261	87	6.9	2	4
Sulfadiazine.....	503	16	3.2	2	0
Sulfapyrazine.....	132	11	8.3	0	1
Succinylsulfathiazole...	13	1	...	0	0
Sulfaguanidine.....	22	1	...	0	0
Total.....	1,936	116	6		

* Not counting reactions or deaths that came after home treatment with sulfonamides.

much the same. Table 2 demonstrates the incidence of the various symptoms and syndromes. It includes patients referred because of sulfonamide intoxication.

Fever occurs most frequently between the fifth and tenth days of therapy. It is usually above 102 F. and, when chills occur, rises as high as 106 F. The fever may be of a plateau type or may mimic a septic source with daily elevations. In a small number of cases there is a relative bradycardia. The white blood cell count may be as high as 20,000 or may be within normal limits. Unfortunately there is no absolute method, short of discontinuing the sulfonamide, of differentiating such fever from that produced by the infection for which the drug is given. Frequently, however, there are clinical signs of resolution of the infection, or one is aided by the appearance of skin manifestations.

Skin lesions usually appear between the second and tenth days. Sulfathiazole usually produces a tender erythema nodosum, most frequently found on the extensor surfaces of the extremities and on the face. Sulfathiazole may also produce a morbilliform erythematous rash, either localized or widespread. This is similar to the lesions produced by sulfadiazine in 3 cases. The skin lesions may become pustular with continued administration of the drug.

Conjunctivitis, frequently associated with erythema nodosum, occurred only in patients treated with sulfathiazole in our series. It occurred between the fifth and fourteenth days and was bilateral in all but 1 case. The erythema and moderate edema of the bulbar conjunctiva may be accompanied by burning of the eyes and photophobia.

Nausea and vomiting, distressing symptoms that contributed to the discarding of sulfapyridine, occur infrequently with sulfathiazole and rarely with sulfadiazine. It usually appears after the first dose of the drug, in contrast to similar symptoms which may appear later as a result of uremia due to sulfonamide nephrosis or tubular obstruction. It is usually possible to change immediately to another sulfonamide with prompt relief of the emeses.

Polyn neuritis, which is usually asymmetrical, has a remarkably high incidence. This may be due to the nutritional state of the patients of the Cincinnati General

Hospital.¹ Its onset with pains, burning, numbness or tingling has occurred as early as the seventh day of treatment and perhaps as late as six months after a course of sulfonamide.

Delirium is difficult to attribute to sulfonamides, since it occurs so frequently in febrile disorders. As a rule it occurs in association with other toxic manifestations of the drugs, particularly renal complications.

Polyarthritides and arthralgia appeared in a small number of our cases between the second and twelfth days.

Alterations in the blood and bone marrow were noted eleven times in the case of sulfathiazole, once with sulfapyrazine and not at all with sulfadiazine. Others have reported similar reactions with sulfadiazine, however, and we have seen it several times in patients not included in this series. These reactions may occur at any time in the course of therapy. Leukopenia gives no clinical sign. Thrombocytopenia is, of course, usually associated with hemorrhagic phenomena, hemolytic anemia with jaundice, and agranulocytosis with dirty ulcerations of the mouth and pharynx.

injury of the secreting portion of the kidney. In this paper we refer to the former as "calculi" or crystalline obstruction and to the latter as sulfonamide nephrosis. The former has been the most common in this series but has not caused death. All the fatal cases here described were due mainly to nephrosis.

Crystalline obstruction or "calculi" may be asymptomatic, but generally hematuria and sometimes renal colic appear from the second to the eighth day. These signs may be followed by drug retention, oliguria, albuminuria, anuria and uremia. In our group of 30 patients that developed this picture, the smallest dose was just under 3 Gm. of sulfathiazole. We believe a urine p_H of 7 or above and a high urine urea content aid tremendously in elimination of the crystals.

Sulfonamide nephrosis, characterized by drug retention, and a rising blood urea nitrogen may or may not be accompanied by oliguria and anuria and by albuminuria. It has occurred in patients receiving sodium bicarbonate. It may occur in conjunction with a systemic picture of encephalopathy, myocarditis, hepatitis, anemia, leuko-

TABLE 2.—Symptoms in Relation to Drug and Dosage in the Medical Wards of the Cincinnati General Hospital, January 1940 to April 1944

	Sulfathiazole				Sulfadiazine				Sulfapyrazine				Succinyl-sulfathiazole				Sulfaguanidine			
	Number of Cases	Days of Appearance	Dose, Gm.		Number of Cases	Days of Appearance	Dose, Gm.		Number of Cases	Days of Appearance	Dose, Gm.		Number of Cases	Days of Appearance	Dose, Gm.		Number of Cases	Days of Appearance	Dose, Gm.	
			Range	Average			Range	Average			Range	Average			Range	Average			Range	Average
Fever.....	43	5-10	16-99	47	2	3-34	42-190	..	2	1-6	13-44	..	1	7	91	..	1	8	23	..
Skin lesions.....	39	2-10	5-264	45	3	8-34	55-190	..	..	..	..	..	..	..	..	..	..	..	..	..
Calculi.....	18	2-7	3-68	27	6	2-8	8-51	20	6	2-8	14-99	41	..	..	..	..	..	..	..	..
Nephrosis.....	5	1-5	6-19	10	3	2-4	12-55	..	1	5	48	..	..	..	..	..	1	5	23	..
Delirium.....	3	2-4	26-70	39	1	1	22	..	..	..	..	..	..	..	..	..	..	..	..	..
Nausea and vomiting.....	13	1	8-58	26	..	....	....	..	1	6	44	..	..	..	..	..	..	..	..	..
Conjunctivitis.....	10	5-18	21-103	63	..	....	....	..	1	3	17	..	..	..	..	..	..	..	..	..
Hemolytic anemia.....	4	5-14	40-56	51	..	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..
Leukopenia.....	5	4-10	19-56	32	..	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..
Agranulocytosis.....	2	21	56*	..	..	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..
Arthritis.....	1	4	16	..	1	5	24	..	..	..	..	..	..	..	..	..	..	..	..	..
Arthralgia.....	3	2-12	8-99	46	..	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..
Neuritis.....	6†	7 days to 6 mo.	50-197	76	3†	9-36	27-100	65	..	..	..	..	..	..	..	..	..	..	..	..
Hepatitis.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rash with edema.....	1	13	48	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* Total dose of sulfadiazine, succinylsulfathiazole and sulfathiazole.
† Two patients received sulfadiazine and sulfathiazole; 1 received sulfaguanidine, sulfapyrazine and sulfathiazole.
‡ One patient received sulfapyrazine and sulfathiazole.

None of the toxic symptoms are of particularly deadly portent. Most of them disappear within one to two days after discontinuance of the sulfonamide, except that neuritis may not. Leukopenia may disappear even while treatment with the sulfonamide continues. When the onset of peripheral neuritis occurs during treatment, the necessity of treatment must be weighed against the possibility of a persistent neuritis after recovery. Thiamine has not cured or prevented this form of neuritis. Some of our patients developed neuritis while receiving brewers' yeast, thiamine and liver extract. In others, vigorous treatment with vitamins and diet may have prevented neuritis from becoming worse.

Hepatitis, myocarditis and disorders of other systems undoubtedly occur, but as yet our clinical methods of evaluation are too limited to make it possible to be certain in their recognition.

The most troublesome toxic symptoms center about the kidney and the urinary tract. These have been the most dangerous to the patient and most difficult to diagnose in early stages. They appear in two separate forms but may overlap. The one is mechanical obstruction of the renal pelvis or ureter by crystals; the other is

cytosis and fever and is readily confused with Weil's disease when the history of sulfonamide ingestion is lacking. It appeared in 10 of the cases collected, and the smallest dose of drug (sulfathiazole) was 6 Gm. It was noted regularly between the first and fifth days that the first manifestation was a rising blood urea nitrogen level.

The treatment of renal complications must suit the individual case. Because of the frequency with which renal complications occur, daily fluid intake and urinary output, and frequent examination of the urine for erythrocytes and blood for drug level and nonprotein nitrogen should be a routine. For hematuria the urine should be alkalinized promptly by administration of sodium bicarbonate, and fluids should be administered to bring the urinary output to at least 1,200 cc. per day. If oliguria or retention of drug or nonprotein nitrogen develops, fluid intake should be increased, but if improvement does not result the drug should be discontinued. Ureteral catheterization is indicated if anuria is preceded by hematuria and renal colic. Only 1 of our patients has benefited by this procedure.

The value of routine alkali treatment concomitant with the sulfonamides is still open to question. Although it is true that sulfonamides are more soluble in alkaline

1. Blankenhorn, M. A.: Multiple Peripheral Neuritis Occurring with Sulfonamide Therapy, *Ann. Int. Med.* 20: 423 (March) 1944.

solutions and consequently might have less opportunity of depositing in the genitourinary tract, the increased rate of excretion tends to reduce the blood level of the sulfonamide to below effective range. Of the 30 patients with urinary complications due to sulfonamides, 11 had received alkali by mouth during sulfonamide administration. Four of these so treated were among the 11 who died. Five of the patients who died were given alkali by mouth or parenterally after the appearance of renal failure. Nine of the 11 were given parenteral fluids in an attempt to increase the flow of urine. Dehydration at this stage did not play a significant part.

were not considered to be of clinical significance and occurred infrequently. They included soreness of the neck and shoulder muscles, headache, dysphagia, weakness, malaise and pruritus.

Similar symptoms of toxicity apparently occur with sulfamerazine. Of 86 patients thus far given this sulfonamide, 9 have developed such untoward reactions. Three showed leukopenia, 2 fever, 1 delirium, 1 hematuria alone and 2 nephrosis. The majority of these patients suffered from pneumococcal disease.

Of the 1,936 patients included in the general report, the death of 4 (0.2 per cent) could be attributed mainly,

TABLE 3.—Deaths Due to Renal Complications of Sulfonamide Therapy in the Medical Wards of the Cincinnati General Hospital, January 1940 to April 1944 *

Name	Age	Sulfonamide	Dose, Gm	Diagnosis	Primary or Secondary Cause of Death	Early Signs and Symptoms	Late Signs and Symptoms	Autopsy
R. C.	75	Thiazole	22	Bronchopneumonia, arteriosclerosis and hypertensive heart disease, bronchial asthma	Primary	Oliguria, hematuria, general arteriosclerosis	Oliguria, hematuria, azotemia (blood urea nitrogen 165)	Sulfathiazole crystals in tubules and pelvis of kidneys and in ureters
V. C.	81	Thiazole	33	Bronchopneumonia, general arteriosclerosis, diverticulitis	Primary	General arteriosclerosis, poor hydration, microscopic hematuria, incontinence, oliguria	Increasing azotemia, drug retention, acidosis	"Acute pyelonephritis due to crystals"
M. T.*	42	Thiazole	6	? Pelvic disease	Primary	Maculopapular rash, stupor, fever, anemia, blood urea nitrogen 35	Oliguria, anuria, drug retention, blood urea nitrogen 105, fever, coma	Kidneys, multiple milium areas of necrosis. Heart: interstitial myocarditis with few milium areas of necrosis
A. B.*	49	Thiazole	?	Bronchopneumonia	Primary	Nausea and vomiting	Jaundice, oliguria, hematemesis and melena, stupor, anemia, blood urea nitrogen 182-275	None
G. B.	43	Thiazole	16	Lobar pneumonia type I, bacteremia, milium pulmonary abscesses	Secondary	Azotemia, drug retention	...	Active chronic interstitial nephritis, much swelling of tubular epithelium
H. M.	44	Thiazole	34.5	Chronic pyelonephritis, hypertensive cardiovascular disease with encephalopathy	Secondary	Chronic pyelonephritis with urine albumin + + +, red blood cells, white blood cells and casts + blood urea nitrogen 35	Blood urea nitrogen 171, drug retention, coma	None
B. H.	76	Thiazole	15	Bronchopneumonia, chronic bronchitis, general arteriosclerosis	Secondary	Dehydration, blood urea nitrogen 48, fixed urine specific gravity, anuria, incontinence	Hyperventilation, carbon dioxide 28	None
G. J.	46	Thiazole	15	Bronchopneumonia, hemolytic streptococcus, empyema, hypertensive cardiovascular disease	Secondary	Severe hypertensive cardiovascular disease. Urine white blood cells, casts, red blood cells prior to drug, blood urea nitrogen 42, drug blood level 27.5 mg %	Blood urea nitrogen 149, drug retention, melena (uremic ?), anemia	None
E. R.	86	Diazine	58	Bronchopneumonia, pneumonia type III, arteriosclerotic heart disease	Primary	High level 17 mg %, general arteriosclerosis	Progressive azotemia, confusion, stupor, coma	Acute bronchitis, bronchopneumonia, cardiac dilatation and hypertrophy; toxic myocarditis; arteriosclerosis; severe toxic nephrosis
H. S.	69	Diazine	51	Lobar pneumonia type I, bronchial asthma, chronic bronchitis	Primary	Arteriosclerosis, microscopic hematuria	Gross hematuria, oliguria, blood urea nitrogen 70	None
R. F.	41	Pyrazine	99	Staphylococcal septiemia	Secondary	Drug level 20 mg %, oliguria, blood urea nitrogen 39 %	Rising azotemia, anuria, coma	Sulfapyrazine crystals in renal calyces, pelvis, cortices and medullae and ureters

* Including patients treated at home

A patient who has toxic symptoms from a specific sulfonamide need not necessarily display signs of toxicity with another. In this series we have been able to find 6 instances in which initial treatment with sulfathiazole resulted in rash, fever, nausea and vomiting or hematuria. All 6 were changed directly to sulfadiazine. In 4 the untoward reactions including hematuria, subsided immediately. In 2 (fever, rash) the toxic symptoms recurred.

In 2 instances in which sulfadiazine produced azotemia, sulfathiazole was substituted after omission for a few days. The azotemia did not recur. In 1 case, however, after 90 Gm. of sulfathiazole, fever, cutaneous lesions and conjunctivitis appeared.

Numerous minor subjective complaints appeared which could be attributed to the sulfonamides. These

perhaps solely, to the action of the sulfonamides. In 5 more instances death was probably hastened by the administration of sulfonamides. To this group are added 2 cases of sulfathiazole intoxication with resultant death in which the drug was given in the home by a private physician. All these patients died with renal complications due to sulfonamides. Six necropsies were performed in this group of 11 deaths.

Table 3 shows the pertinent clinical data including autopsy. In the 6 cases thus examined, obstruction of the pelvis or ureter did not occur. Crystals were recorded as the evidence of sulfonamide intoxication, but crystals or calculi did not obstruct. None of the patients examined post mortem were anuric.

Five of the cases might be classed as nephrosis. In only 2 of these was there an early manifestation of

sensitivity; i. e., in 1 a typical rash developed and in another nausea and vomiting were noted from the first dose.

There were certain signs and conditions in these individuals which warned against indiscriminate use of sulfonamides. Five showed advanced arteriosclerosis and 2 impaired renal function. The earliest manifestations of unfavorable action of the drug were varied and seldom subjective—usually microscopic hematuria, oliguria, incontinence and drug retention. None had renal colic. The signs of uremia later developed.

Although the blood urea nitrogen is one of the most useful of indexes in this problem, its magnitude has apparently little relation to the survival or recovery of the azotemic patient when the drug is discontinued. In one individual who recovered, the blood urea nitrogen rose to 135 mg. per hundred cubic centimeters. In another it was 70 mg. per hundred cubic centimeters on the day of death. Seventeen of those with genito-urinary complications who recovered had blood urea nitrogen levels over 50 mg. per hundred cubic centimeters. It has been routine in this medical service to measure the urea nitrogen on all patients before and during treatment with sulfonamides. An initial level as high as 70 or 80 mg. per hundred cubic centimeters does not defer cautious treatment of acute infectious disease. Should the level of nitrogenous products rise constantly however during sulfonamide therapy, it is wise to discontinue the drug regardless of the drug blood level.

It is apparent, then, that with advanced age and renal disease sulfonamides should be prescribed cautiously and the treatment followed carefully. With the onset of persistent hematuria, decreased urine output, signs of azotemia and unusually high levels of sulfonamide in the blood or of any one of these manifestations, treatment should certainly be discontinued.

It is obvious that the early signs of severe reactions are so occult as to be revealed usually only by laboratory studies. There is nothing, unfortunately, that bedside appraisal of the patient will yield in the early diagnosis of the fatal sulfonamide reaction.

SUMMARY

Among 1,936 patients toxic reactions were recorded among 116, an incidence of 6 per cent. These reactions were usually of such severity as to compel the arrest of treatment. Occasionally treatment could be resumed by changing to another drug. This could be done oftenest by changing from sulfathiazole to sulfadiazine.

Death was ascribed to toxic effects mainly in 4 instances (0.2 per cent) and death in 5 was certainly hastened by drug intoxication. All fatal toxic reactions were mainly renal and resulted in uremia.

In no instance was blockage of the pelvis or ureter thought to be the cause. There was no correlation of the milder forms of intoxication to the more severe or lethal.

Therefore there are no premonitory signs of renal intoxication. Mild signs of disease of the kidney pelvis are microscopic hematuria, oliguria, incontinence, pain and elevated blood urea.

If these signs are observed, sulfonamide treatment should be stopped or continued with great care lest nephrosis occur. The use of alkali and water usually corrects mild symptoms. By the time classic symptoms of uremia appeared, no form of treatment was effective.

In this series blockage of the renal tubule was considered the cause of death; hence ureteral catheterization was not helpful. In disease of the tubule, symptoms may be absent until the disease is well established and irreversible.

ABSTRACT OF DISCUSSION

DR. LAWRENCE D. THOMPSON, St. Louis: Few reports have covered such a large series of cases and have been so well analyzed as this report by Drs. Vilter and Blankenhorn. The comparative incidence of reactions with the various drugs agrees closely with the majority of reports. The report of Hageman, Harford, Sobin and Ahrens from our clinic revealed little difference in the incidence of reactions following the use of sulfadiazine and sulfamerazine. My own observations, although covering a series only about one third as large, are in close agreement with those reported, with a possible exception in the cases of renal complications; the incidence of these complications has been somewhat smaller. It is accepted that age and preexisting renal damage predispose to renal complications following the use of sulfonamide drugs. Since most of the cases were observed in the St. Louis City Hospital, this series should be comparable to that of Vilter in respect to this factor. The forcing of fluids is also a generally accepted part of sulfonamide therapy. The deliberate limiting of fluid intake in order to secure a high blood level of the drug early in the course of treatment is to be condemned most emphatically; unfortunately, this tendency has appeared repeatedly during the past year. The use of sodium bicarbonate may have contributed to this difference in results. The wisdom of the routine use of sodium bicarbonate is still under debate. The increased solubility of the drugs in alkaline urine is undisputed. The early observations of Hartmann and his co-workers, which indicated the harmful effect on the kidneys of an alkalosis combined with the use of sulfanilamide and sulfapyridine, made such an impression on me that only rarely have I given sodium bicarbonate. Later studies have made it clear that sulfanilamide and the more recent sulfonamides cannot be compared in many respects. Perhaps it was an error to apply this rule with the use of sulfathiazole and sulfadiazine; however, like sulfanilamide, these drugs are reabsorbed to a significant extent by the renal tubules. This reabsorption has been shown to be an active process by the tubular cells. The harmful effect of either acidosis or alkalosis on already impaired tubular cells has been pointed out by many students of renal physiology and pathology. Until more exact information is available, it is logical to assume that two agents, each of which in itself may impair renal tubular function, should not be used together except for some very special purpose and then under most careful observation. The repetition of observations on the toxicity of these drugs, particularly as to the effect on the renal tubules, such as the work of Shannon under the experimental condition of deliberate alkalosis, might throw some light on this debated point.

DR. S. L. BERNSTEIN, Cleveland: What is Dr. Blankenhorn's opinion of the administration of the sulfonamide drugs on ambulatory patients? I recall giving a man aged 60 a small dose of sulfanilamide for a septic throat, without a culture. He had a total of 20 grains (1.3 Gm.), with alkali, for three days. He had to be urged to go to the hospital because of agranulocytosis. Fortunately, he recovered. Since then I have been chary about prescribing sulfonamides to ambulatory patients. One sees many prescriptions at the drug stores, with doctors prescribing them for ambulatory patients. The druggists are beginning to prescribe them over the counter, and this is becoming a serious question.

DR. DAVID LEHR, New York: In experiments on the prevention of renal obstruction, the animals received repeated intraperitoneal injections of sodium sulfadiazine in amounts known to produce massive precipitation of sulfadiazine in the renal tubules, provided no therapy was employed. Stomach tube feedings of water alone did not provide adequate protection. Animals of this group succumbing to the sulfadiazine intoxication revealed without exception massive intratubular precipitation

of sulfadiazine accompanied by severe tubular dilatation and degeneration of the kidneys. The striking success of alkalization (sodium bicarbonate) in combination with the "forcing of fluids" was clearly borne out by the high rate of survival (no death) and the almost complete absence of significant pathologic lesions in the alkali treated animals. These measures were of little value once the renal obstruction was fully developed. In such instances the "forcing of fluids" actually produced water poisoning. In the treatment of renal obstruction, standardized experimental conditions were established in the following manner: The renal block was produced by intraperitoneal injection of a single fatal dose of sodium sulfadiazine. If left untreated, the animals invariably developed pronounced renal obstruction from intratubular precipitate of sulfadiazine, and 80 to 90 per cent succumbed to this complication after two to three days. Treatment consisted in stomach tube feedings of fixed amounts of water or salt solutions (containing either sodium bicarbonate, ammonium chloride, a mixture of these two or sodium chloride). The most striking result was achieved with solutions of sodium chloride and of the mixture of sodium bicarbonate and ammonium chloride. They made possible the complete recovery of all rats from an otherwise fatal sulfadiazine intoxication, whereas no benefits were derived from the "forcing" of water alone. The water-sodium bicarbonate combination even shortened the time of survival (alkalosis), and ammonium chloride, in addition to a further reduction of the life span, also increased the mortality to 100 per cent (acidosis). Apparently water alone is reabsorbed rapidly under the conditions of a block in the collecting tubules, whereas in the presence of salts of high osmotic value some of the water might be forced to remain in the tubules, dilate them and push the tubular plugs down and out of the kidney. The life saving effect of salt diuresis in renal obstruction from sulfadiazine has been learned in experiments with more than 200 animals.

DR. M. A. BLANKENHORN, Cincinnati: Dr. Thompson and I come to the same consideration of the problem of the general practitioner who gives sulfonamides; namely, damage to the kidney. The matter of making alkalis mandatory with sulfonamide medication is a weighty one, and being responsible for rather a large service with a great variety of patients and a great variety of house officers, I am unwilling to make it mandatory in the service for the reasons of which Dr. Thompson mentioned a few. Perhaps we might have improved our service had we been able to give alkalis intelligently. Merely to exhibit alkalis to the patient is far from meeting the indications of alkalizing urine. Alkalis may be given in too great an amount, and they may be given in an insufficient amount. The object is to alkalize the urine. We used nitrazine paper to test the urine, when freshly voided, as our criterion of alkalization. That is a simple device which any general practitioner can put into the hands of his nurse. Litmus paper is not reliable. I may have been misleading in my discussion of the treatment and the prophylaxis of renal complications in mentioning water. Dr. Lehr, when I said "water" I meant water as a vehicle for glucose, saline, alkali in the form of bicarbonate and lactate. To answer Dr. Bernstein on the use of sulfonamides for ambulatory patients, if I should draw on my own experience I would be absolutely against it. I have seen individuals carried into the hospital in a desperate condition, and I have not counted the deaths that I have seen in other hospitals where ambulatory patients had been treated or received. There are several in my experience, and my advice would be not to give it to ambulatory patients. I am not unfamiliar with Dr. Lehr's work and with the work of others who have concentrated on the function of the tubule and its reaction to this drug, because that is where the work must be done, and it is from such experimentation that the answer may come. The use of alkalis in moderate dose, in advance of treatment or with treatment, will not always prevent fatal damage to the kidney. I speak particularly of that lesion of the kidney which involves the parietal structure of the kidney, as well as the tubule. That is a cellular infiltrate resembling granuloma. Just why that lesion occurs, I do not know. Two of the patients not counted in this series that I have seen had that disorder of the kidney from relatively small doses. That was the unfortunate individual who is sensitive to the dose and has perhaps an allergic reaction.

THE SIGNIFICANCE OF MUSCLE SPASM

IN THE ACUTE STAGE OF INFANTILE PARALYSIS
BASED ON ACTION CURRENT RECORDS

R. PLATO SCHWARTZ, M.D.

HARRY D. BOUMAN, M.D.

AND

WILBUR K. SMITH, M.D.

ROCHESTER, N. Y.

The total time interval required for essential agreement on some phases of infantile paralysis includes the names of Heine,¹ Medin,² Wickman,³ Lovett⁴ and many others. During this period and since that time a steady flow of literature has provided evidence of the great efforts which have been made in the study of all aspects of a disease which annually disables great numbers of children and adults.

Out of all this there came the confirmation of a correlation between the pathologic changes and the clinical characteristics of infantile paralysis. Thus it became established that the disabilities provoked by this disease were directly proportional to the degree and extent of permanent damage to the lower motor neurons on which normal muscle function was dependent.

Spasm in the muscles of the neck and back, the spine sign, was a noted characteristic of early onset. Hyperesthesia was less frequent but carefully distinguished from muscle soreness, tenderness and pain. The latter usually prevailed but was most variable as related to degree and duration.

In 1916 Lovett⁵ and, more recently, Ober⁶ and others have recorded the observation that moist heat relieves muscle pain and soreness. The prescription of rest for the affected extremity was then logically based on principles which are today recognized as sound practice in all phases of clinical medicine and surgery.

When considered as a unit, each of three parts, (1) the pathologic characteristics, (2) the clinical manifestations and (3) the treatment, were related so naturally in the form of a premise that they have held together with ease for more than three decades.

But none of us would hesitate to divorce ourselves from this or any other premise when presented with the evidence that it was wrong. However, any logical premise which has slowly developed from the work of many men in various countries should not be readily discarded on the basis of a different opinion which depends solely on clinical observations relevant to some particular manifestation of a disease.

This brings us to Sister Kenny's concept of infantile paralysis. It is based on her personal observation of

Read before the Harvard Seminar Group on Thursday, Sept. 30, 1943.
Aided by a grant from the National Foundation for Infantile Paralysis, Inc.

From the University of Rochester School of Medicine and Dentistry, Department of Surgery, Division of Orthopaedics and Department of Anatomy.

1. Heine, J.: Beobachtungen über Lähmungskrankheiten der unteren Extremitäten und deren Behandlung. Stuttgart, F. H. Kohler, 1840.

2. Medin, O.: Ueber eine Epidemie von spinaler Kinderlähmung. Verhandl. d. internat. med. Cong. (1890) 2: 37, 1891; Infantile Paralysis with Special Reference to Its Acute Stage. Nord. med. Ark. G: No. 1, 1896; translated, Arch. de méd. d. enf. 1: 257 and 321, 1898.

3. Wickman, I.: Studien über Poliomyelitis acuta; zugleich ein Beitrag zur Kenntniss der Myelitis acuta, Berlin, S. Karger, 1905; reviewed, Arch. de méd. d. enf. 9: 636, 1906.

4. Lovett, R. W., and Richardson, M. W.: Infantile Paralysis, with Special Reference to Its Occurrence in Massachusetts, 1907-1910, Am. J. Dis. Child. 2: 369 (Dec.) 1911.

5. Lovett, R. W.: The Treatment of Infantile Paralysis, ed. 1. Philadelphia, P. Blakiston's Son & Co., 1916, ed. 2, 1917.

6. Ober, I. R.: Pain and Tenderness During Acute State of Poliomyelitis, J. A. M. A. 120: 314 (Oct. 17) 1942.

patients during and after the acute stage of the disease. In Pohl's⁷ most recent book on the subject it is stated that:

Infantile paralysis is neither a simple disease nor one completely understood. The destruction of anterior horn cells of the spinal cord is certainly not the principal nor the most important characteristic and does not explain the presenting symptoms of the disorder. From the discussion presented, infantile paralysis affects both muscles and nerve tissue and is a disease capable of widespread disorganization of the neuromuscular system. The condition of muscle spasm is the symptom common to all cases. Untreated spasm destroys muscle tissue and is the cause of contractures, stiffness and deformities. In addition, the pathophysiological symptoms of mental alienation of muscle and incoordination of muscle action implicate the more highly organized portions of the nervous system. Paralysis is unfortunately a feature of the disease, but paralysis proves after all to be a minor consideration in most cases of infantile paralysis. Muscle spasm, mental alienation and incoordination are far more damaging to bodily mechanics. Acceptance of these true symptoms forms the true basis on which the treatment of the disease can be designed. Only meticulous attention to all of the disturbed structures can reduce the evil after-effects of the disease.

Spasm . . . if untreated will result in permanent muscle damage, stiffness and skeletal deformities.

. . . muscle spasm in the acute stage appears almost to have the properties of an acute inflammatory process capable of causing serious and permanent changes in the muscle substance.

. . . the examination of the patient should not include stretching, squeezing or manipulation of the affected muscles, nor should the patient be requested to make any voluntary efforts at contraction of the muscle.

It is recognized that certain muscles, noticeably the opponents of the muscle in spasm, have become nonfunctioning. This is of no immediate concern, since these nonfunctioning muscles usually are simply alienated. Such muscles, however, cannot be restored except by first treating the condition of spasm in the opponent. Attempts to determine the presence or absence of contractile power in muscle are therefore not only impossible and of no value, but they have the serious effect of increasing the spasm in the affected muscles. Under no circumstances should the acutely ill patient be encouraged to contract any of his muscles for the purpose of recording the so-called muscle test.

Inspection or observation alone usually suffices for the purpose of analysis of the muscle condition.

Critical examination of infantile paralysis in the acute stage will present abundant evidence to show that orthodoxy has erred both in the recognition as well as in the interpretation of the physical findings of the disease.

Miss Kenny's real contribution is not a new treatment for the disease of infantile paralysis as it has been conceived in the past but a conception of the disease itself so radically opposed to the old as to almost warrant considering the entity as a new disease. The basic principles . . . [are] . . . built upon observations of the behavior of the musculature. . . .

In short, Miss Kenny's discovery is that infantile paralysis is a disease in which disturbance of physiological function of the nervous system is of more importance than actual architectural change. Many of the observable clinical phenomena are the result of functional disorganization of the motor centers and of the nerve pathways to the muscles. The disease affects muscle as well as nerve tissue. Muscle spasm is the primary lesion in the disease rather than paralysis. Miss Kenny has designed a treatment for these conditions. Needless to say, the treatment could have nothing in common with the previous methods, designed for a disease of opposite conception.

Any concept such as this one should not be accepted or rejected on the basis of clinical observation alone. An objective analysis of the new versus the old concept revealed a common agreement on one point; i. e., neuromuscular dysfunction was the cause of disabilities and therefore continued to be the reason for the great efforts made to bring infantile paralysis under control. This point in common should therefore lead to agreement that a lowering of incidents of disabilities, subsequent to the acute onset of the disease, is dependent on the discovery of more effective methods of preventing the impairment of muscle function. From this point it naturally follows that a continuation of past efforts toward this objective might be favored by additional information regarding the behavior of the neuromuscular mechanism in the acute stage of infantile paralysis.

It therefore became our purpose to investigate the characteristics in the behavior of the neuromuscular mechanism, primarily as related to the acute stage of infantile paralysis, for comparison with the recorded characteristics of normal individuals and the records of patients with other established neuromuscular disabilities. In so doing it was indicated that we should pay particular attention to any and all evidence through which the significance of muscle spasm might be evaluated.

Here we venture to state that a similar point of view may have prompted the electromyographic studies made by Watkins, Brazier and Schwab.⁸ It was gratifying to note the agreement between their recorded evidence and that which we reported in 1942.⁹ This fact is far more important than that we offer a slightly different explanation for the recorded abnormal functions of the lower reflex arc.

With the introduction of muscle spasm as the dominant influence contributing to disability, the authors previously quoted also accepted the possibility of paralysis on the basis of established evidence of partial damage to or complete destruction of the lower motor neuron innervation, in part or in toto, to one or more muscles. The absence of conclusive evidence in support of the statements which have been quoted regarding muscle spasm cannot be regarded as evidence that spasm might not play a significant role in producing disabilities. However, the clinical and myographic records of muscle spasm in the acute stage of infantile paralysis should not be interpreted as evidence which confirms the "new concept" as quoted.

But this "new concept" has already been found to be at variance with the distribution of spasm as recorded by action currents through the oscillograph. Our original report and that of Watkins, Brazier and Schwab emphasized that muscle spasm in the acute stage of infantile paralysis was not limited to the "antagonists of nonfunctioning muscles." On the contrary, both of these investigations gave evidence which emphasized the presence of spasm in the "nonfunctioning" or weakened muscle and in muscles which showed no clinical or other evidence of weakness, as indicated by successive records from respective patients.

In attempting to clarify this situation we have found that available methods for evaluating the role of muscle spasm are very limited. But it is evident that both mus-

7. Pohl, J. F., and Kenny, E.: *The Kenny Concept of Infantile Paralysis and Its Treatment*, Minneapolis, Bruce Publishing Company, 1943, pp. 37-38, 59-60 and 61-62.

8. Watkins, A. T., Brazier, M. A. B., and Schwab, R. S.: *Concepts of Polymyositis, Based on Electromyographic*, 188 (Sept. 25) 1943.
Bouman, H. D.: *Muscle Spasm in the Acute*, as Indicated by Recorded Action Current Potentials, J. A. M. A. 119: 923 (July 18) 1942.

cle weakness and muscle spasm are respective states of abnormal function which are expressed through the lower motor neuron. To differentiate between these two states of abnormal muscle function it was found that action current records provided the most useful evidence.

Four action current amplifiers were constructed for use with a multiple recording oscillograph, for making records of the reaction on one or a maximum of four muscles simultaneously, to stretch reflex or voluntary contraction.

A total of 50 individuals have been studied: normal subjects 9, spastic paralysis patients 6, infantile paralysis patients 23, miscellaneous patients 12. The total number of records has been from Nov. 22, 1941 to July 1, 1943 3,622 and from July 1, 1942 to July 1, 1943 2,879.

The past year's work has added confirmation to the summary of recorded evidence reported in 1942 and provides a more lucid interpretation of this evidence than has heretofore been possible. Naturally this approach directs primary attention to prevailing abnormalities in the function of the neuromuscular mechanism of the lower reflex arc during the acute stage of infantile paralysis.

However, a satisfactory understanding of the recorded reactions which are to be enumerated cannot be provided by the simple concept of upper and lower motor neurons without designation of the mechanisms which may be altered by the direct or indirect effect of the virus of infantile paralysis to produce the respective abnormal functions.

Interpretation in this instance should be based on the present available information concerning the intrinsic structures and function of the normal lower reflex arc. This should include information concerning the normal structural and functional relationships which the lower motor neuron bears to other nerve cells at its own and at other levels; i. e., its relation to all neuronal pathways which make essential contributions to every physical effort that requires muscular coordination.

As this information is still in a formative state, our interpretation must be based on the knowledge which is available at the present time.

As part of the spinal reflex arc and as the effector cell of "the final common path," the lower motor neuron plays an obviously essential role in all reflex and voluntary contractions of skeletal muscle. The fact that the lower motor neuron can be excited to discharge by impulses passing over the dorsal spinal nerve roots is axiomatic. That these dorsal root impulses can excite the cell directly or through the medium of interneurons seems established by the investigations of Renshaw¹⁰ and of Lloyd.¹¹ In addition, the lower motor neuron is bombarded by volleys of impulses passing over pyramidal and extrapyramidal pathways, these impulses reaching the motor neuron probably through the medium of interneurons.

It is important for the lower motor neurons to respond to impulses which reach them, but it is just as important that these same neurons at times should be rendered inactive. An example of this phenomenon is the well known fact that under certain circumstances sensory impulses passing into the spinal cord are pre-

vented from exciting the lower motor neurons to discharge, and these sensory impulses may even block or nullify the effect of other impulses impinging on the motor neuron from other levels of the nervous system. This phenomenon of inhibition leads to the relaxation of antagonists during the performance of muscular movements and thus facilitates their proper execution. At present we have no generally accepted explanation of the mechanism of the inhibitory process. It appears that the functional reaction of the lower motor neuron as related to transmission of impulses by way of the axon to striated muscle fibers is determined by some mechanism at or related to internuncial cells or to the many synapses associated with the dendrites and cell body of the lower motor neuron.

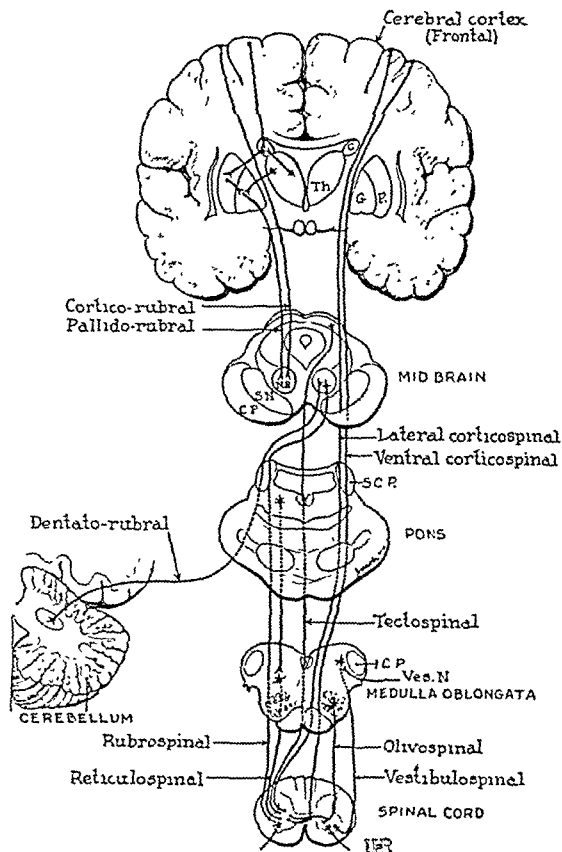


Fig. 1—Diagram showing some of the descending pathways which influence the spinal motor neuron: C, caudate nucleus; C. P., cerebral peduncle; G., globus pallidus; I. C. P., inferior cerebellar peduncle; N. R., red nucleus; P., putamen; S. C. P., superior cerebellar peduncle; S. N., substantia nigra; Th., thalamus; Ves. N., vestibular nerve.

In figure 1 some of the pathways through which the lower motor neuron receives a multiplicity of inhibitory and excitatory impulses are diagrammatically indicated.¹² The large number of synaptic connections which the lower motor neuron makes with internuncial cells and the axons of dorsal root ganglion cells is in sharp contrast to the single axon over branches of which the former sends impulses to more than one hundred muscle fibers at the rate of five to ten per second for the maintenance of normal tone and at a greater frequency for increased muscular contraction.

When considered as a unit, the cell body of the motor neuron, while making numerous synaptic connections, is regarded as essentially free from structural connec-

10. Renshaw, B.: Activity in Simplest Spinal Reflex Pathways, *J. Neurophysiol.* 3: 373, 1940.

11. Lloyd, D. P. C.: Reflex Action in Relation to Pattern and Peripheral Source of Efferent Stimulation, *J. Neurophysiol.* 6: 111, 1943; Neuron Patterns Controlling Transmission of Ipsilateral Hind Limb Reflexes in Cat, *ibid.* 6: 293, 1943; Conduction and Synaptic Transmission of Reflex Response to Stretch in Spinal Cats, *ibid.* 6: 317, 1943.

12. Although we use the term inhibitory impulses, there is no evidence to indicate that impulses causing inhibition differ in any way from those causing excitation.

tions with other neurons which combine to form the neural mechanism for normal muscular control. It is at this level, proximal to the dendrites and the motor cell body, that internuncial cells are present and to them has been largely assigned the function of transmission or rejection of impulses through to activate the motor

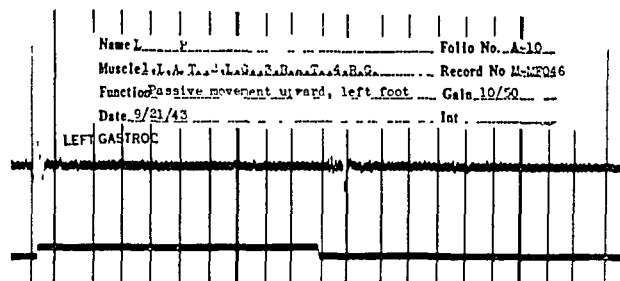


Fig 2—Reaction to stretch (stretch reflex) of the left gastrocnemius muscle of a normal person. Upper line, action currents of gastrocnemius muscle; lower line, signal indicating duration of stretch line in all records 0.1 second and 1 second (heavy line).

cell from which impulses are sent via its axon to the muscle. In addition, the physiologic state of the motor neuron itself is also a determinant factor as to whether or not it is excited to discharge by impulses impinging on it.

In a much less literal sense we may regard the multiple branching axon terminals of the lower motor neuron as somewhat separated from each of the more than one hundred muscle fibers thus innervated. Reference is here made to the non-neural character of the "sole plate," i. e. the group of cells which forms the structural connection between the axon terminals of the lower motor neuron and the striated muscle fibers.

The addition of the sensory relationship to the lower motor neuron-muscle complex is required to complete the elements essential for a simple spinal reflex arc. The "knee jerk" is frequently cited as a typical spinal reflex. Likewise it is an example of the stretch reflex and has proved to be both an important and a fundamental means of eliciting information. By stretching the muscle with a blow on the patellar tendon from a percussion hammer, afferent impulses normally pass from the muscle to sensory ganglion cells of the second to the fourth lumbar and thence to the lower motor neurons, the axons of which transmit the impulses to the quadri-

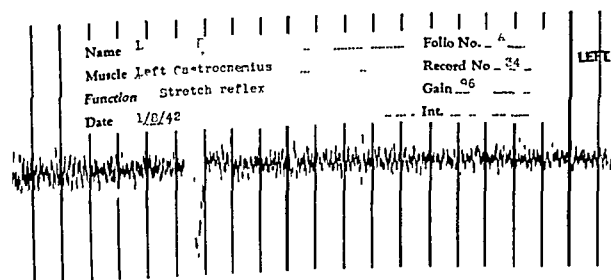


Fig 3—Reaction to stretch (stretch reflex) of left gastrocnemius muscle of patient with infantile paralysis.

ceps muscle, which contracts to produce extension at the knee joint. The investigations of Renshaw¹⁰ and of Lloyd¹¹ show that within a single spinal segment the large nerve fibers conducting afferent impulses from the muscle receptors over the dorsal spinal roots synapse directly with the lower motor neuron without the mediation of internuncial cells, thus creating a two-neuron arc reflex pathway. In contrast, reflex discharges over the ventral roots, as a result of impulses

from cutaneous receptors, appear to involve a multi-neuron reflex arc including internuncial cells interposed between the axon of the sensory cell and the lower motor neuron. It is of course not possible at the present time to be certain that all of the fibers carrying impulses from the muscle receptors synapse directly with the lower motor neurons or that all of the fibers carrying impulses from cutaneous receptors form connection with the lower motor neuron by means of interneurons, but evidence indicates that such is probably the case in animals under experimental conditions.

By this brief summary of influences under which the lower motor neuron exercises its normal function, our appreciation for the systemic manifestations of infantile paralysis is in no way lessened. Moreover, we are fully aware that repeated observations of the past thirty years have continuously emphasized the effects of the virus of infantile paralysis at nearly all levels of the central nervous system. But, without the associated impairment of muscle function this disease would become relatively unimportant.

However, as related to the latter point our attention must continuously be focused on the functional disturbances of the lower reflex arc as they have been found to prevail in relation to muscle spasm with or without muscle weakness, during the acute stage of

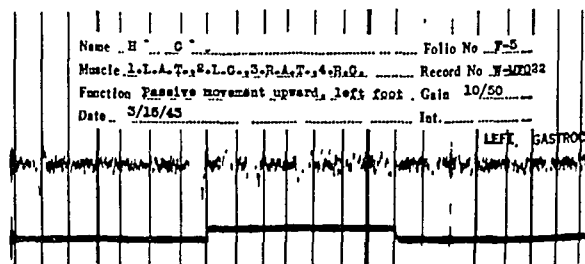


Fig 4—Reaction to stretch (stretch reflex) of left gastrocnemius muscle of a patient with spastic paralysis: upper line, action currents of left gastrocnemius muscle; lower line, signal indicating duration of stretch.

infantile paralysis. The stretch reflex of a normal lower reflex arc always produces a characteristic action current record as in figure 2. For this reason, departure from this characteristic action current reaction indicates that abnormal conditions prevail somewhere within or related to the lower reflex arc.

In muscles examined during the acute stage of infantile paralysis, the stretch reflex usually produces a record indicating the prolonged contraction of muscle fibers, as related to both time and degree (fig. 3). This abnormal reaction to the stretch reflex is the phenomenon which we have interpreted as muscle spasm in the acute stage of infantile paralysis.

Here it should be emphasized that the magnitude of spasm thus recorded is in no way comparable to that which we clinically observe, as in spastic paralysis and the like (fig. 4), so readily revealed by both clinical examination and the characteristic dysfunction which it produces.

These characteristics of muscle spasm, which we have recorded in almost every instance, have usually been of such low magnitude that there was seldom agreement between various individuals on clinical examination. However, we have on rare occasions seen intermittent contractions in an anterior tibial muscle. The tendon became prominent at the rate of ten to fifteen times per minute, for a period of twenty minutes in one

instance. The boy, aged 6, stopped crying when the spasmodic contractions of the anterior tibial muscle ceased.

But evidence of spasm was never present when a muscle literally failed to give any action current response to the stretch reflex. In all such instances the muscle was considered as completely paralyzed at the time the record was made. This was regarded as an important observation. It provided a starting point from which we begin to answer questions regarding the evidence of spasm when it is expressed in association with weakened muscles or muscles of normal strength.

From this finding we may conclude that the prevailing evidence of spasm is not due to the intrinsic reaction of muscle fibers as it has been described in association with inflammation or the fibrillation which is said to follow section of the motor nerve to a muscle. We are therefore forced to conclude that in this instance the muscle is deprived of all motor impulses without any associated muscle fiber contractions. An oscillographic record of a completely paralyzed muscle showing no evidence of action current reaction to a stretch reflex is illustrated in figure 5.

The characteristic pattern of a weakened muscle's reaction revealed that its response to voluntary contraction stimulus was often less than the spasm which followed stimulation by stretch reflex.

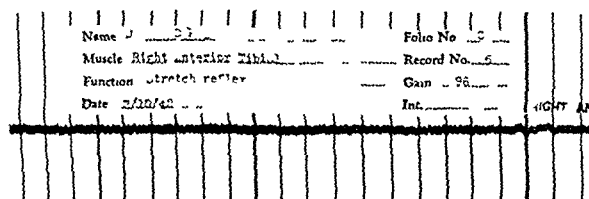


Fig 5—Patient with infantile paralysis. The reaction to stretch in a completely paralyzed muscle (right anterior tibial), i. e. muscle which shows no evidence of action currents in maximal voluntary effort

This has been found to be a common behavior of weakened muscles. There are two plausible interpretations: (1) that more lower motor neurons are stimulated by the stretch reflex than the number which is activated by the voluntary effort to contract the weakened muscle; (2) that, although an equal number of lower motor neurons are stimulated in each instance, a greater number of impulses are induced by the stretch reflex than result from voluntary effort.

This evidence further indicates that voluntary impulses from proximal centers may be more effectively blocked than the sensory impulses which are stimulated by the stretch reflex. From this, therefore, one might conclude that the damage of lower motor neuron cells is not as great as the initial loss in voluntary function would indicate. From this it would follow that impairment of muscle function in the acute stage of infantile paralysis may be due to any one or any combination of the following causes: (1) injury or death of the lower motor neuron cell body; (2) partial or complete block of voluntary impulses from higher centers without damage to the lower motor neuron cell; (3) inhibition of contraction due to the presence of impulses arising within the muscle, i. e. muscle soreness and pain, and that muscle spasm does not initiate the development of muscle weakness as indicated by clinical observation and the following action current records.

The "nonfunctioning" or weakened muscle usually produces a characteristic pattern in response to voluntary and reflex stimulation. The voluntary contraction

of the left gastrocnemius muscle, free from clinical evidence of weakness, is illustrated in figure 6 A. The voluntary contraction of the weakened right gastrocnemius muscle, same patient, is illustrated in figure 6 B. It is apparent that there was much less response in the weakened muscle than in the normal muscle. On

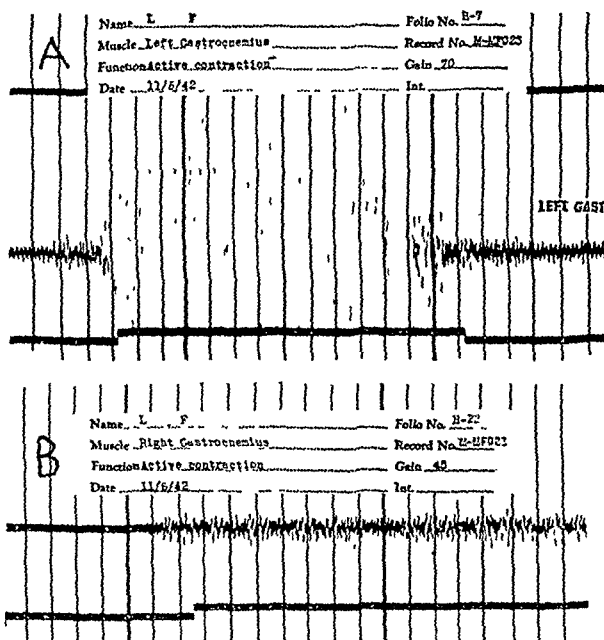


Fig 6—Patient with infantile paralysis. A, record of maximal voluntary contraction of relatively normal left gastrocnemius muscle; upper line, action currents of left gastrocnemius; lower line, signal indicating duration of movement. B, record of maximal voluntary contraction of weakened right gastrocnemius muscle; upper line, action currents of right gastrocnemius; lower line, signal indicating duration of movement

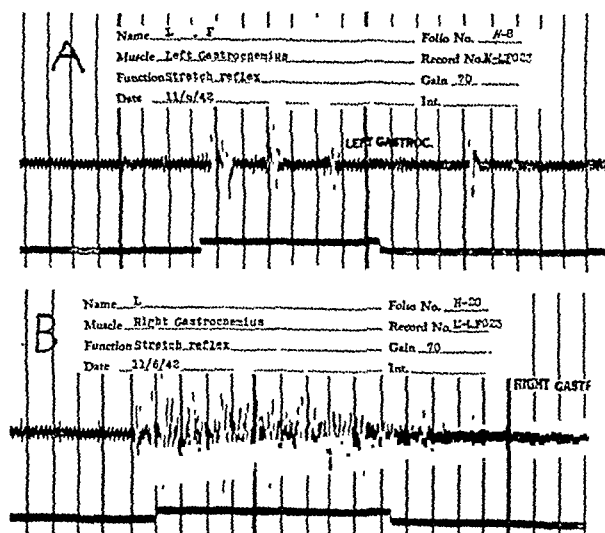


Fig 7—Same muscle as figure 6 A, record of reaction to passive stretch; upper line, action currents of left gastrocnemius; lower line, signal indicating duration of stretch. B, same muscle as figure 6 B, record of reaction to passive stretch (stretch reflex); upper line, action currents of right gastrocnemius; lower line, signal indicating duration of stretch

stretch reflex of the muscle with normal strength a low magnitude of spasm, as previously defined, was recorded as in figure 7 A, while the stretch reflex of the weakened muscle, figure 7 B, produced spasm greater in degree than the reaction of the same muscle to voluntary effort as recorded in figure 6 B.

In either situation it follows that estimation of the voluntary contraction strength of a weakened muscle does not provide a reliable index of the total capacity of the lower motor neurons which activate the muscle.

As a companion to this reaction there was another which was unanticipated. When the stretch reflex

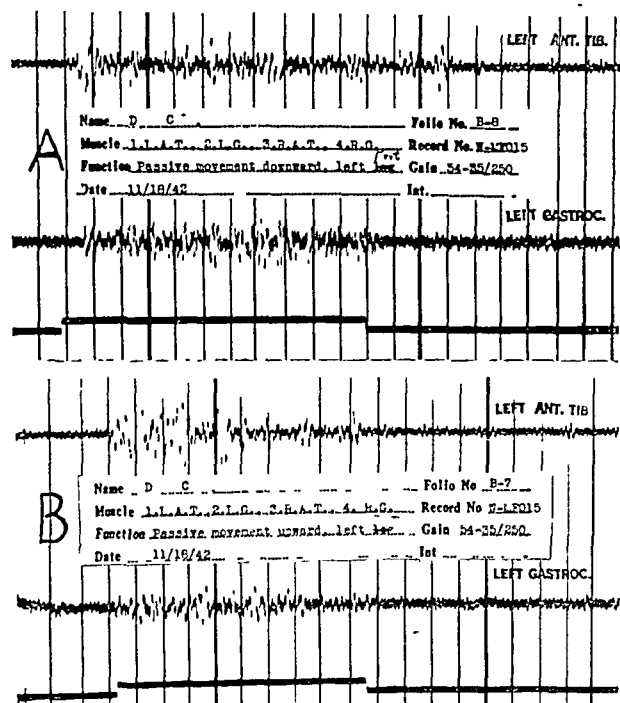


Fig. 8.—Patient with infantile paralysis: A, reaction in left anterior tibial and gastrocnemius muscles to stretch of left anterior tibial muscle, upper line, action currents of left anterior tibial muscle; middle line, action currents of left gastrocnemius muscle; lower line, signal indicating duration of stretch; B, records from same muscles, record of passive stretching of left gastrocnemius

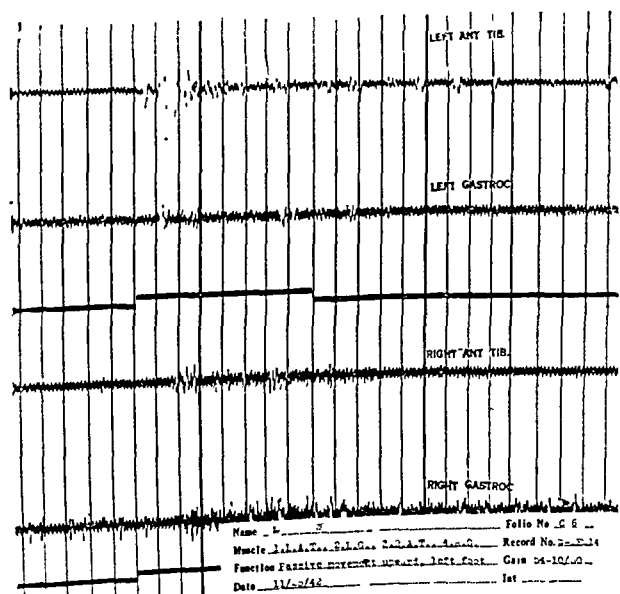


Fig. 9.—Patient with infantile paralysis: Record of action currents of both anterior tibial and gastrocnemius muscles in passive stretch applied to left gastrocnemius; top line, action currents of left anterior muscle, second line, action currents of left gastrocnemius; third and sixth lines, action currents of stretch; fourth line, action currents of right anterior tibial; fifth line, action currents of right gastrocnemius

reaction of a weakened left anterior tibial muscle was recorded simultaneously with its antagonist, evidence of spasm was definite in the records of respective mus-

cles (fig. 8 A). Likewise when the gastrocnemius was subjected to stretch reflex, there was recorded evidence of spasm in both the weakened muscle and its antagonist as illustrated in figure 9 A. This evidence has been interpreted as a reversal of Sherrington's principle of reciprocal innervation. The action current response of a normal left anterior tibial muscle to a stretch reflex applied to its antagonist, the left gastrocnemius, is illustrated in figure 10.

It was observations such as these which emphasized the need for recorded evidence of the reaction of four muscles simultaneously when the stretch reflex was applied to one of the four. Action current records were therefore made as indicated in figure 9. In this instance the stretch reflex was applied to the left gastrocnemius and evidence of spasm was recorded in both the gastrocnemius and the anterior tibial on the left leg and in the corresponding muscles of the right leg. The prevailing evidence of spasm in muscles of the side opposite to the applied stimulus is in sharp contrast with the corresponding reaction of normal muscles as indicated in figure 12. We have also found that the same cross stimulation was provoked by voluntary contraction of the left gastrocnemius, figure 13. A diagrammatic expression indicating how the prevailing dysfunction may provoke this particular behavior on the part of the lower reflex arc is presented in figure 11.

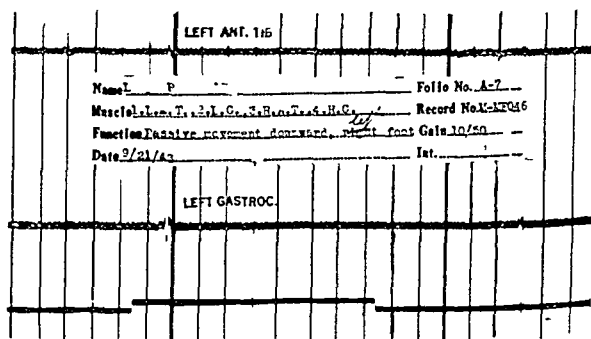


Fig. 10.—Record of same muscles as in figure 8 in a normal person on passive stretch applied to left anterior tibial

The evidence presented, therefore, indicates that during the acute stage of infantile paralysis the normal function of the lower reflex arc is grossly altered. Such alteration is clinically expressed by partial or complete loss of muscle function. It is also revealed in action current records indicating the presence of spasm in weakened muscles and muscles of normal strength, when respective muscles are stimulated by stretch reflex. It is further emphasized by reversal of the Sherrington reciprocal innervation together with cross stimulation of agonist and antagonist when one of the corresponding muscles on the opposite side is stimulated by stretch reflex or voluntary contraction. But it should be emphasized that this recorded evidence of altered function, (1) spasm, (2) reversal of the Sherrington reciprocal innervation and (3) cross stimulation, all gradually disappeared subsequent to the passing of muscle soreness and pain, which is not always present but when present is always first to disappear. If and when disabilities prevail in the postacute stage, they are expressed in terms of muscle weakness or complete paralysis, usually the former, without clinical or recordable evidence of (1) spasm, (2) reversal of the Sherrington reciprocal innervation or (3) cross stimulation herewith described.

It is during the earlier months of the postacute stage that initially paralyzed muscles may show some return of function and weakened muscles usually regain an appreciable percentage of normal strength. It has been emphasized for fully three decades that such spontaneous improvement is most likely to express itself during the first six months after onset, the rate of improvement thereafter declining during the next six to twelve months.

Such evidence of improvement in strength of a weakened muscle is revealed in action current records of voluntary contraction against resistance of the observer's hand (fig. 14 *A* and *B*). We have found that muscle spasm, stimulated by stretch reflex, diminishes during this period (fig. 15 *A* and *B*). But it does not follow that the disappearance of spasm is necessarily accompanied by full restoration of strength in the weakened muscle. Action current records of weakened muscles, made one to four years after onset, revealed the weakness of voluntary contraction but failed to show evidence of spasm in any of the various manifestations herewith presented as common to the acute stage.

From the interpretation of records let us turn to the clinical record on which the Kenny concept is solely dependent. In 1932 work done by the International Committee on Infantile Paralysis¹³ represented a critical analysis of more than 8,000 references. All authorities agreed on the high incidence of muscle spasm in

of muscle weakness or paralysis if and when either became apparent. But the presence of muscle spasm in the extremities was not noted and emphasized as it was in relation to the neck and back.

Moreover, from the inverse relationship of the maximum degree of muscle spasm prevailing in the acute

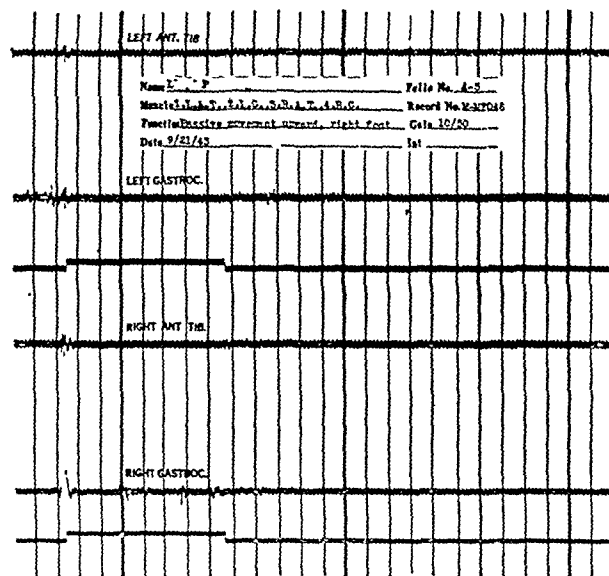


Fig. 12—Records from same muscles as in figure 9 in a normal person on passive stretching of right gastrocnemius

stage of infantile paralysis and the least percentage of weakness or paralysis in the neck and back muscles there was no indication that this spasm was the primary cause of the disabilities which create fear of this disease.

From the available conclusive data we establish the following points:

1. In some patients spasticity has been recorded in all muscles which we have investigated
2. Evidence of spasticity has been recorded from (a) weakened muscles, (b) the antagonists of weakened

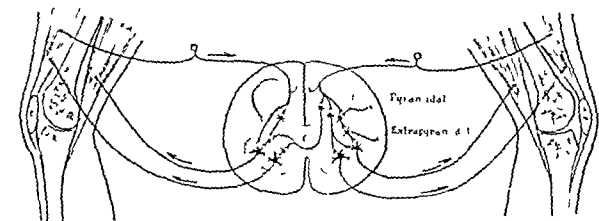


Fig. 11.—Diagram showing some of the neurons involved in a spinal reflex. Only one level of the second to fourth lumbar region which contributes to the knee jerk is shown. Other levels of the spinal cord show similar connections. For explanation see text.

the neck and back as characteristic of the early onset of infantile paralysis. But despite this fact it was also noted that the incidence of muscle function impairment in the neck and back was much less than at any other levels of the body. Wernstedt's¹⁴ figures on 5,948 cases are typical of the percentage distribution of Lovett and other authorities: cranial nerves 13.3 per cent, throat and neck muscles 5.8 per cent, trunk 27.8 per cent, arm 41.3 per cent and leg 78.6 per cent. Lovett's¹⁵ total of 1,529 cases gave the following distribution: one or both legs (with or without one or both arms) 83.3 per cent, one or both arms (with or without one or both legs) 38.7 per cent, abdomen 72.0 per cent, back 13.5 per cent and neck 11.0 per cent.

The common stiffness and less frequent rigidity of the neck and back was invariably accompanied by muscle soreness and pain. The presence of the latter in the extremities was noted to prevail before the onset

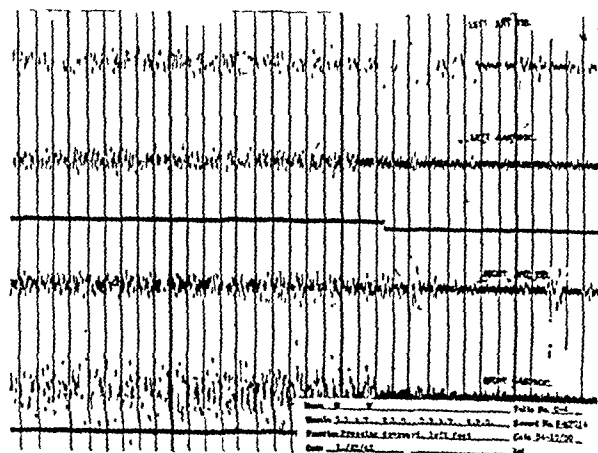


Fig. 13—Same patient as in figure 9. Action currents of same muscles obtained during voluntary contraction of left gastrocnemius

muscles and (c) muscles which exhibit no clinical or other evidence of weakness.

3. The evidence does not support the view that fibrillation or inflammation of the muscle is responsible for the spasticity.

13. Poliomylitis: A Survey Made Possible by a Grant from the International Committee for the Study of Infantile Paralysis, Baltimore, Williams & Wilkins Company, 1932, p. 173.

14. Wernstedt, W.: Klinische Studien über die zweite grosse Poliomylitis-Epidemie in Schweden 1911-1913. *Ergebn. d. inn. Med. u. Kinderh.* 23: 705, 1924; *Epidemiologische Studien über die zweite grosse Poliomylitis-Epidemie in Schweden 1911-1913*, ibid. 26: 248, 1924.

15. Lovett, R. W.: *Treatment of Infantile Paralysis*, ed. 2 Philadelphia, P. Blakiston's Son & Co., 1917, p. 7.

4. On stretching the antagonist of a weakened muscle, the evidence of spasticity in the weakened muscle is frequently greater than the recorded reaction of the muscle in response to voluntary contraction.

5. On stretch reflex of a weakened muscle, spasticity not only is recorded from its antagonist but also is significantly present in records of the corresponding muscles of the opposite extremity.

6. In association with voluntary contraction efforts this spasticity spread was recorded from the same group of muscles as resulted from stimulation by stretch reflex noted in 5.

7. But a muscle which shows no clinical evidence of weakness always produces a stronger voluntary contraction record than the recorded evidence of muscle spasm.

8. There has never been recorded evidence of spasm when a muscle failed to produce a record of reaction to the voluntary movement.

9. Spasticity is a generalized phenomenon in the early stages of infantile paralysis.¹⁶

10. As prevailing spasm diminished in a weakened muscle, there was recorded evidence of increased strength in the voluntary contraction.

11. The gross initial spasm of neck and back muscles, so characteristic with onset of the acute stage, invariably disappears without evidence of muscle weakness or paralysis.

12. There was no correlation between the degree of spasm and the incidence of muscle weakness or paralysis.

SUMMARY

From action current records made in relation to the study of the neuromuscular reactions of patients in the acute stage of infantile paralysis we conclude that the spine sign is a gross manifestation of the lesser degree of spasm recorded in muscles of normal and subnormal strength.

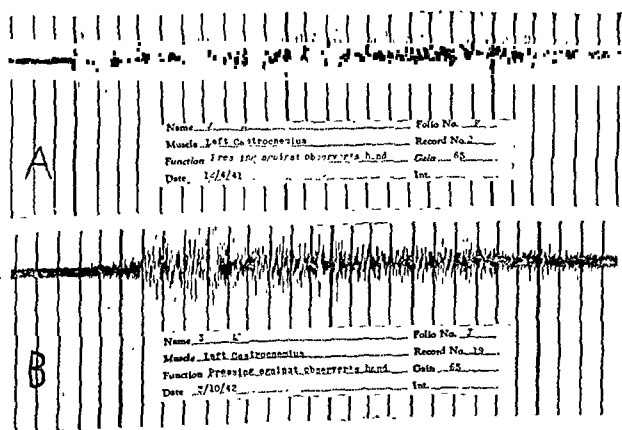


Fig. 14.—Patient with infantile paralysis. A, action current record of maximal voluntary contraction of left gastrocnemius taken Dec. 4, 1941. B, action current record of maximal voluntary contraction of left gastrocnemius muscle taken March 10, 1942.

In association with the latter, certain functional abnormalities other than muscle weakness were observed in the lower reflex arc. They could be most readily explained in terms of a dysfunction at/or proximal

to the dendrites or cell body of the lower motor neuron. This dysfunction resulted in a partial isolation of the lower motor neuron from the inhibition normally induced by other levels through long and short neural pathways. The degree of lower reflex arc isolation thus established and the degree of viability remaining in the

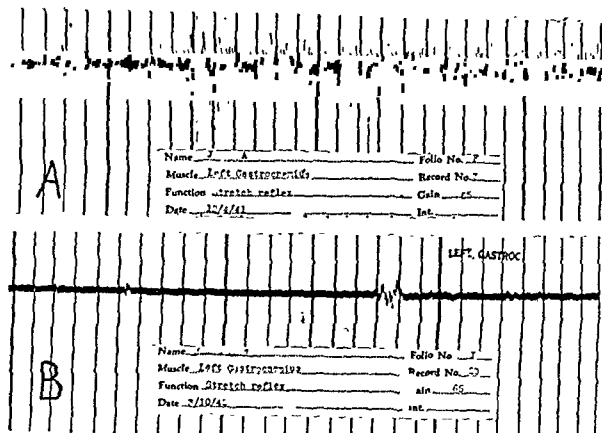


Fig. 15.—Same patient as in figure 14. A, action current record of reaction to stretch (stretch reflex) of left gastrocnemius muscle taken Dec. 4, 1941. B, action current record of reaction to stretch (stretch reflex) of left gastrocnemius muscle taken March 10, 1942.

lower motor neurons therefore determined the amount of muscle spasm in each instance.

Without the involvement of levels proximal to the lower motor neuron there would be no spasm, but the muscle could be either weak or normal, dependent on the number of normal motor neurons innervating the muscle.

If all motor neurons failed to be stimulated by the stretch reflex there would be no reaction to the stretch reflex even though relationships proximal to the dendrites were normal.

Spasticity and weakening are two separate phenomena, each dependent on specific disturbances of functions of the anterior horn cells.¹⁶

There was every indication that spasm ran its course like other clinical manifestations of the disease.

The relationship between muscle tenderness and muscle spasm has not been clarified by the work thus far done. As in the past, we should continue to differentiate between pain and hyperesthesia from discomfort due to muscle soreness.

We have emphasized the clinical phenomena and the electromyographic evidence which indicates that muscle spasm does not initiate the development of muscle weakness.

Racial Theory.—The assumption that blood is transmitted at birth from parents to progeny and is inherent in the clan or race from the very origin of the racial stock was and is the cause of the blood feuds and wars among clans, tribes and nations and still remains the basis of strife between different nationalities. The racial theory recently revived by Hitler in Germany is reminiscent of the primitive fantastic idea that the blood of a people is inherited from the very first progenitor of that people, or race, and that the blood of certain peoples contains higher spiritual powers than that of neighboring peoples. The conclusion is drawn that the blood of mythological Roman heroes still flows in the veins of the modern Italians, and that the mythical blood of Wotan still circulates in the vessels of the twentieth century Nazis.—Gordon, Benjamin Lee: *The Romance of Medicine*, Philadelphia, F. A. Davis Company, 1944.

16. Bouman, H. D., and Schwartz, R. P.: The Degree, the Extent and the Mechanism of Muscle Spasm in Infantile Paralysis, *New York State J. Med.* 44: 147 (Jan. 5) 1944.

Clinical Notes, Suggestions and New Instruments

BANTI'S SYNDROME APPARENTLY DUE TO INFECTION WITH SCHISTOSOMA MANSONI

THOMAS P. ALMY, M.D., AND J. G. MASON HARPER,
NEW YORK

Infection with the blood fluke *Schistosoma mansoni* is a highly prevalent disease in Africa, in the northern parts of South America and in the West Indies as far north as Puerto Rico. In the continents of Europe and Asia there is only one small focus, about the city of Aden, Arabia. The disease has apparently never been acquired on the North American continent (fig 1).

The sharp limits of geographic distribution of the disease are due in part to the complicated life cycle of this flatworm, which requires one of a number of species of snail (of the genera *Planorbis* and *Australorbis*) as intermediate host. After development within the snail, the schistosome emerges as a larva, the cercaria, which swims freely near the surface of fresh water streams and ponds and there is capable of penetrating human skin.

Within the human host the growing worms make an extended migration through the blood vessels before reaching their definitive site. They pass in succession through the systemic veins, the right atrium and ventricle, the pulmonary capillaries and the left atrium and ventricle, to be distributed widely in the systemic circulation. Those which reach the mesenteric capillaries pass through into the portal vein, where they reach maturity, mate and then migrate backward in the portal system to reach the venules in the mucosa and submucosa of the colon. This migration is usually not attended by symptoms. When, however, the gravid female worm deposits her eggs in minute venules just beneath the mucosa of the colon, the eggs induce local necrosis, usually with slight hemorrhage, production of small ulcers and symptoms suggestive of mild dysentery. Over a period of many years, during which the disease is clinically silent, a considerable number of ova may be swept by the portal current to the liver, where each produces a minute area of necrosis. These miliary necroses are healed by scarring and the nearly typical portal cirrhosis may be complicated by splenomegaly, ascites and other sequelae of portal hypertension.

In the case herein described, the typical features of Banti's syndrome were apparently due to infection with *S. mansoni*. A number of such cases in former residents of the endemic areas have been previously identified in the United States by Price¹ and others; yet in the records of our large urban hospital, covering thirty years (1914-1944) and nearly 350,000 admissions, this is the first case of schistosomiasis. It is reported not only for its relative rarity but also as an illustration of the influence of geography on clinical diagnosis.

REPORT OF CASE

This 44 year old Mohammedan Arab was born near Aden, Arabia, and lived there until 1914, when at the age of 15 he

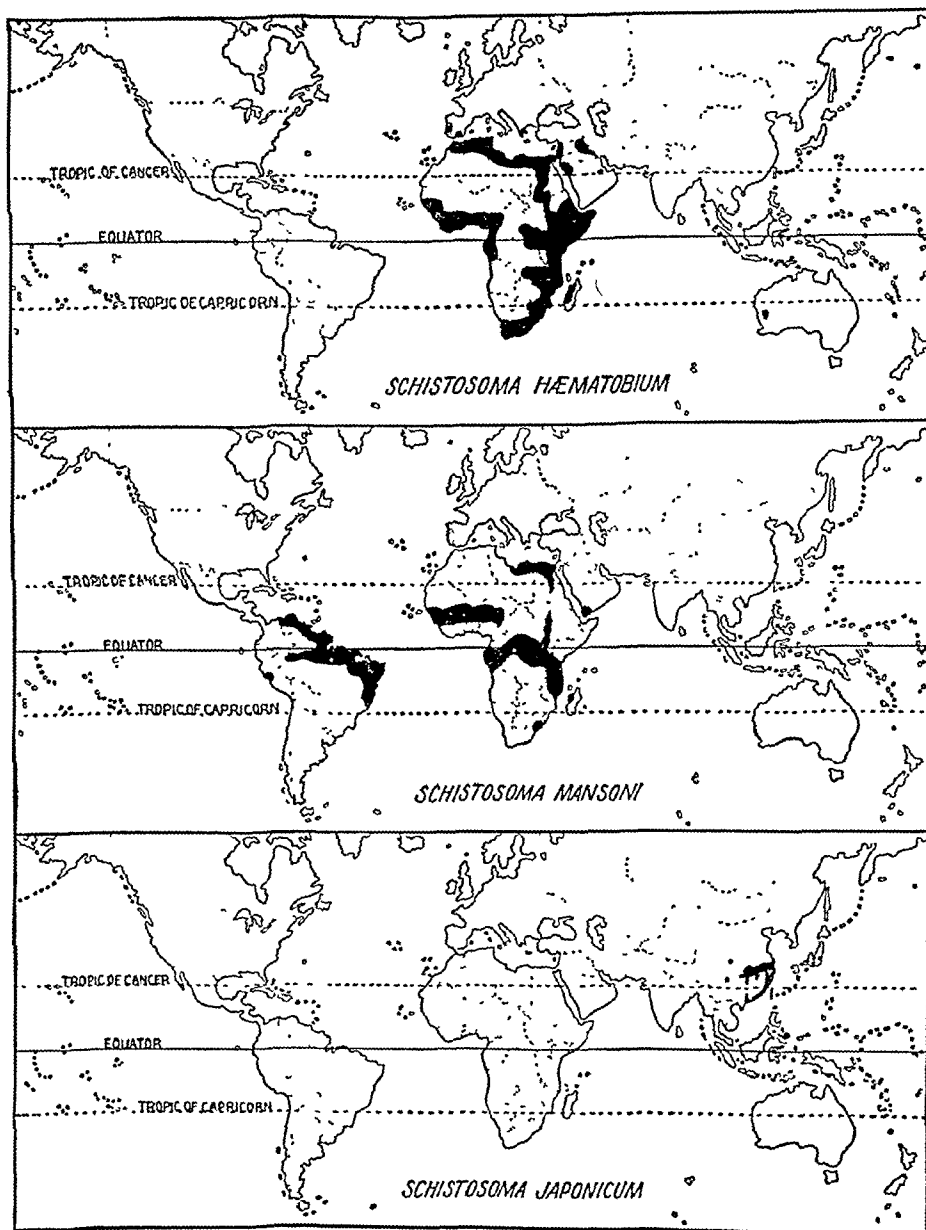


FIG. 1.—The world distribution of schistosomiasis mansoni (from Belding Textbook of Clinical Parasitology, New York: D. Appleton Century Company).

¹ From the Department of Medicine of New York Hospital and Cornell University Medical College.

Dr. Henry E. Melrose, professor of preventive medicine at New York University, gave helpful suggestions as to diagnosis and therapy. Dr. J. T. Culbertson, assistant professor of bacteriology at the Columbia University College of Physicians and Surgeons, supplied antigen for skin testing.

joined the British navy. For five years he traveled widely in the navy and then in the merchant marine, only once going ashore, for a few hours, in an area infected with *S. mansoni*. This was at an Egyptian port, and he had no contact with fresh water while ashore. He landed at Portland, Maine, in 1919 and has remained in the United States since that time.

¹ Price A. S. Schistosomiasis (*S. Mansoni*). A Report of 7 Imported Cases. Rev. Gastroenterol. 6: 215, 1939.

The patient recalled a few episodes of diarrhea with bloody stools at about 14 years of age but remembered no notable pruritus, severe cough or hemoptysis. He had enjoyed excellent health until his present illness. His diet included moderate amounts of fruits and vegetables and small amounts of lean



Fig. 2.—Patient's protuberant abdomen, with transverse groove.

meat. He abstained from alcohol. Two years before admission, when a left inguinal hernioplasty was performed, his spleen was found to be enlarged.

The patient had suffered from a chronic dry cough during the winter for many years. Ten months before admission,



Fig. 3.—Outline of liver and spleen.

following a fracture of two ribs in a fall downstairs, he had persistent, more severe coughing, and mild malaise. Three months before admission he became conscious of increasing weakness and weight loss. One month later he first noted heaviness and swelling of the abdomen and swelling of the legs. He became decidedly dyspneic on mild exertion, having to stop

after climbing seven steps, but had no orthopnea. He had no nausea or vomiting, no hematemesis or melena, no notable abdominal pain and no jaundice.

The patient was dark skinned and moderately well nourished. His abdomen was protuberant and he was coughing, but he could lie flat without distress. His mucous membranes were pale. The scleras were slightly yellow and displayed bilateral pingueculae. The diaphragms were high, and there were fine moist inspiratory rales at both bases. The heart was not enlarged and was without murmurs. The sharp edge of a hard, nontender liver was felt 7 cm. below the costal margin in the midclavicular line, and the hard, rounded tip of the spleen was felt at the level of the umbilicus. A shallow transverse groove about 3 cm. wide extended across the abdomen at the level of the umbilicus (figs. 2 and 3). There was no fluid. A reducible inguinal hernia was present under an oblique left lower quadrant scar. There was moderate edema of both ankles and pretibial areas.

Examination of the urine showed rare red blood cells and leukocytes. Blood examination revealed hemoglobin 5.2 Gm., erythrocytes 3,600,000, hematocrit 26 per cent, platelets 90,000, reticulocytes 0.5 per cent and leukocytes 4,000 with 6 per cent lymphocytes, 10 per cent monocytes, 12 per cent eosinophils, 2 per cent basophils, 53 per cent mature polymorphonuclears and 17 per cent band forms. The serum protein level was 6.3 to 7.4 per cent with globulin content 3.2 to 4.1 per cent. The cephalin

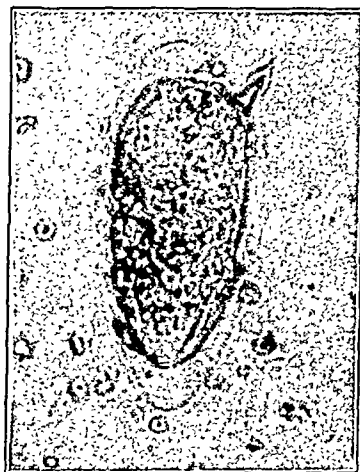


Fig. 4.—Ovum of *S. mansoni* (from Giffen in Belding: Textbook of Clinical Parasitology, New York, D. Appleton-Century Company).

flocculation test was 3 plus and the flocculation test for syphilis (Mazzini) was 3 plus, with the Wassermann reaction negative. The icterus index was 6.0. The prothrombin level (Werner, Brinkhous and Smith method) was 53 per cent and rose only to 55 per cent after 2 mg. of menadione was injected intramuscularly. Chest x-ray and barium enema were negative. A gastrointestinal series disclosed large esophageal varices. The stools were uniformly positive for occult blood.

The patient was given iron sulfate, elixir of choline chloride, daily intramuscular injections of crude liver extract and a high protein, high carbohydrate diet with supplements of crystalline vitamins. After three weeks his hemoglobin had risen to 11.9 Gm. and his erythrocyte count to 4,900,000, his leukocyte count was unchanged and his eosinophil percentage had fallen to 4. Ankle edema was no longer present and he felt much stronger.

At this time it was suspected that he might have schistosomiasis, and a skin test was performed with antigen obtained from the frog lung fluke (*Pneumoneces medioplexus*).² This was moderately positive. Repeated stool examinations were made by various methods of concentration. On the eleventh such examination, in which the acetic acid-ether method of de Rivas³

2. Culbertson, J. T., and Rose, H. M.: Skin Tests in Schistosomiasis with Antigen from *Pneumoneces Medioplexus*, *Am. J. Hyg.* 36: 311, 1942.

3. de Rivas, D.: An Efficient and Rapid Method of Concentration for the Detection of Ova and Cysts of Intestinal Parasites, *Am. J. Trop. Med.* 8: 63, 1928.

was used, an ovum of *Schistosoma mansoni* was found (fig. 4). This observation was repeated in six different preparations from two stools, and the identity of the ova was confirmed by Dr. Ralph W. Nauss, parasitologist to the New York Hospital.

The patient was then treated with fuadin in 6.3 per cent solution, given daily by muscle in dosage increasing from 0.8 cc. to 5 cc. and then maintained at this level for nine additional injections given every other day—a total of 62.6 cc. There were no toxic manifestations and no further change in the symptoms and signs of hepatic disease, or in the blood count, except for a secondary rise of the eosinophil percentage to 25 at the end of treatment. The cephalin flocculation reaction during treatment was 1 plus.

When the patient was last seen, ten weeks after the conclusion of treatment, strength and exercise tolerance had improved. He had climbed ten flights of stairs slowly without stopping. Although ankle edema had disappeared, he had maintained his weight. The liver and spleen were not changed in size. The blood count had remained the same except for a secondary fall of the eosinophil percentage to 7.

COMMENT

In retrospect, there were several reasons for suspecting the parasitic origin of Banti's syndrome in this patient. He had spent the earlier years of his life in a recognized endemic focus of schistosomiasis mansoni. His abdomen presented a shallow transverse groove similar to that described by Faust and Meleny⁴ in advanced cases of schistosomiasis japonica. It is thought by them to indicate adhesions of the omentum and mesentery to the abdominal wall, with contraction of scar tissue in these adherent structures. To our knowledge this clinical feature has not previously been described in schistosomiasis mansoni. The patient's blood showed an eosinophilia, which is rarely seen in Banti's syndrome of nonparasitic origin. The diagnosis was strongly suggested by a positive skin reaction to a trematode antigen but could not be considered as established until the ova of *S. mansoni*, after a prolonged search, were identified in the stool.

The chronicity of this patient's disease was of special interest. It is probable that he was infected at his place of birth, which he left thirty years ago. It is certain that he was infected more than twenty-five years ago, since which time he has lived in the United States.

In the late stage of schistosomiasis which this patient illustrates, treatment with anthelmintic drugs is risky. It is widely held that in the presence of advanced hepatic damage antimony and potassium tartrate is contraindicated and fuadin must be used with caution. Furthermore, the benefit to the patient of such treatment is small, because most of the clinical phenomena are due to irreversible scarring of the liver. The early stages of the disease, those characterized clinically by skin rashes, asthmatic states and protean gastrointestinal symptoms, present greater therapeutic opportunities. In such cases there is usually less difficulty in finding the ova in the stools, but their presence must first be suspected. The variable symptoms and physical signs do not often present a clue and the eosinophilia is inconstant, but any patient may be logically suspected of having schistosomiasis who has exposed himself to fresh water in one of the sharply limited endemic foci of the disease. It is therefore suggested that the first consideration in diagnosis is a geographic one, the fact of exposure to the disease. In the near future, with many Americans returning from endemic foci of schistosomiasis, such thinking may become important in clinical diagnosis.

SUMMARY

Banti's syndrome occurring in a 44 year old Arab was found to be due to schistosomiasis mansoni, although the patient must have acquired this infection more than twenty-five years before the onset of symptoms. The patient was treated with fuadin, with indeterminate results. As it provides a valuable clue in the clinical diagnosis of schistosomiasis mansoni, stress is laid on the limited geographic distribution of endemic foci of this disease.

4. Faust, E. C., and Meleny, H. E. Studies on Schistosomiasis Japonica, Monographic Series no. 3, Baltimore American Journal of Hygiene, 1924, p. 222.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following report. HOWARD A. CARTER, Secretary.

TELEX NEW "SUPER HEARING AID
(Model #1550)
ACCEPTABLE

Manufacturer: Telex Products Company, Telex Park, Minneapolis.

This is a vacuum tube hearing aid consisting of four midget tubes, a transmitter, a crystal receiver in a flesh colored molded case and a battery unit. Weights and overall dimensions of the various parts of Model #1550 are as follows:

Transmitter, 4 inches by 2¼ inches by ¾ inch, weight with cords 5 ounces.

Receiver, crystal, 1 inch in diameter.

Batteries, weight 11 ounces.

Total weight of the entire instrument is 16 ounces.

Batteries.—Voltages and current drains are as follows:

A battery, 1.5 volts.

Current drain at ½ volume 110 milliamperes.

Current drain at full volume 110 milliamperes.

B battery, 45 volts.

Current drain at ½ volume 1.5 milliamperes.

Current drain at full volume 1.5 milliamperes.

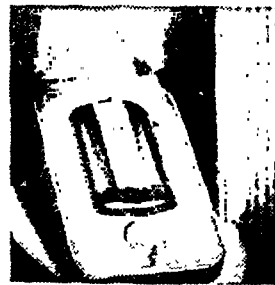
An additional drain of 0.3 milliamperes occurs with loud signal.

Acoustical Gain.—The following data are the average of observations of two trained observers using fitted ear molds seated 5 feet from the loud speaker delivering frequencies of pure sine wave characteristics. (Test made with tone control at "normal white dot position.")

Volume Control Set at	Frequency							
	256	512	1,024	1,448	2,048	2,896	4,096	
½	9	6	8	14	11	10	13	Decibels
¾	15	10	15	19	16	14	18	Decibels

Overall gain for speech 31 decibels. This is an intelligibility speech measurement based on what the patient can understand without the hearing aid and with it.

Physical and Mechanical Features.—The instrument consists of a black plastic molded case of convenient size and pleasing appearance. It is very well made. The electrical assembly has been done in a thoroughly workmanlike manner. There are two controls, one the volume control, a studded disk placed on the top of the instrument. It operates smoothly and easily. A second, the tone control situated on the upper left hand corner of the side, operates in three positions marked by blue, white and red dots. The cord connections are well made and seem to maintain their position without shifting. The battery pack is conventional in type.



Telex Hearing Aid, Model 1550.

Performance.—In this test the instrument submitted performed as represented. At full volume, however, there is definite feed-back squeal even with a tight fitting receiver. At full control the instrument performs unusually well. As shown in the graph submitted by the firm, shifts in the low frequency are emphasized very definitely. The booklet of instructions is complete and adequate.

Recommendations.—The aid itself and the descriptive matter which were submitted fulfils the requirements for acceptable hearing aids of the Council on Physical Medicine.

The Council voted to accept the Telex new Super Hearing Aid, Model #1550, for inclusion in its list of accepted devices.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO 10, ILL.

Cable Address - - - : "Medic, Chicago"

Subscription price - - - : Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, NOVEMBER 11, 1944

MEDICAL CERTIFICATES AND WAR PRODUCTION

In recent years medical certificates have been required for fuel and food rationing, public health disease prevention programs, food handler control, marriage laws, school regulations and sickness insurance.¹ The good name of the medical profession is sometimes jeopardized by too lenient compliance with appeals for certificates from patients who often have little or no real basis for requesting them. This problem is now especially concerned in present efforts to use limited manpower to its fullest extent in war industries.

Production of munitions would be far from completed even if Germany should capitulate this month. According to War Department announcements, production of heavy trucks, large shells, bombs, rockets, smokeless powder, heavy duty tires, superbombers and large artillery is behind schedule for 1944. These activities must be continued for many months to come if urgent orders from overseas are to be met. The major problem in the production of these critical items is lack of manpower. Lack of labor reserves in many communities, excessive absenteeism and a high rate of labor termination are the controlling factors in producing enough munitions on time. Certain ordnance plants have reported absenteeism amounting to twenty days annually per man² and an annual labor turnover of 100 per cent. Many of these absentees and job terminators can be replaced only with the greatest difficulty.

Many observers believe that the principal underlying cause is the too common attitude that the war is almost over. The feeling of urgency is gone. Liberal disability benefits contribute to these delays. Others who drop out for a few days of hunting or to get in the crops cheerfully extend an unjustified absence and cover up

by alleging illness on return to work. Job quitters likewise are more common than ever because of their understandable desire to obtain more permanent work before present jobs terminate.

Industry, labor organizations, the War Manpower Commission and other interested agencies have instituted an aggressive plan of action to control the ordinary causes of absenteeism and labor turnovers by giving attention to such factors as housing, transportation, shopping facilities, cafeterias, child care and impressing the workers with the urgency of staying on the job.

Illness, both alleged and real, as a frequent cause of absenteeism and work termination is probably the most difficult problem to control by lay agencies. The government and its contracting agents customarily require medical certificates to cover an absenteeism alleged to be illness or a labor termination attributed to reasons of health. The medical profession is then put under pressure by thoughtless persons who see little harm in collecting disability benefits or in obtaining better jobs on pretext of illness. They fail to see the cumulative results of hundreds of thousands of such acts on critical war production.

Responsibility rests squarely on the physician to act as prosecutor, defense attorney and judge before issuing such a certificate. He fails himself, his profession and the war effort if certificates are issued without due cause. The Army³ is prepared to cooperate closely with physicians in industry in order to accumulate facts about alleged illness of an employee and the possible effects of the working environment on the employees' health. Standard practices for the control of health hazards in war industries are available. The medical records of employees and diagnostic services of these plants are generally available to private physicians in troublesome cases and should be utilized fully.⁴

The medical profession is never out of the public eye. The ability of any group of workers persistently to evade the obligations of their jobs through easy availability of medical certificates must inevitably arouse unfavorable public reaction. The War Participation Committee of the Massachusetts Medical Society has established a system for review of medical certificates in that state⁴ worthy of general consideration. Every physician must assure himself that each medical certificate is exactly what it implies—a certified statement of facts based on careful examination and disinterested judgment.

1. McGee, L. C.: Industrial Medical Certification, New England J. Med. **231**: 215 (Aug. 3) 1944.

2. Medical Certification in Industry, editorial, New England J. Med. **231**: 212 (Aug. 3) 1944. Flinn, R. H.: Absenteeism versus Ordnance Production—The Physician's Role, to be published.

3. Cooperation of Plant Physicians with Private Physicians; Industrial Hygiene Information Circular No. 20, Safety and Security Division, Office of the Chief of Ordnance, Army Service Forces, Oct. 29, 1943. Pickard, Karl: The Relation Between the Family Physician and War Industry, New England J. Med., **229**: 714 (Nov. 4) 1943.

4. Massachusetts Medical Society: War Participation Committee, New England J. Med. **231**: 215 (Aug. 3) 1944.

AIR BORNE TUBERCULOSIS

Following development of Topley's¹ method for the study of herd infections, studies of the experimental epidemiology of tuberculosis were begun in the Henry Phipps Institute at the University of Pennsylvania. In the initial experiment Perla² exposed normal guinea pigs to tuberculous cage mates which had been previously infected intraperitoneally with highly virulent bovine type tubercle bacilli. The exposed guinea pigs readily contracted tuberculosis. This with few exceptions had the characters of an infection that had entered by way of the digestive tract. Involvement of the mesenteric and cervical lymph nodes was conspicuous in necropsies with an occasional tuberculous ulcer of the ileum. The infection was apparently the result of fecal contamination of the food material. After such intraperitoneal inoculation guinea pigs usually begin the elimination of tubercle bacilli in the feces within a week. There is a rapid increase in the number of tubercle bacilli per fecal bolus during the terminal weeks of the disease.

In the same experiments Perla found that out of 16 normal guinea pigs placed in the same room but not in the same cages with tuberculous animals 2 guinea pigs acquired tuberculosis, presumably as a result of air borne contagion. Each of these cases had the characters of a bronchogenic infection, the dominant lesions being in the lungs and tracheobronchial lymph nodes.

A more detailed study of air borne tuberculosis was therefore undertaken. Twenty-seven cages, each containing 2 normal guinea pigs, were evenly distributed and left undisturbed for several months in a large room harboring about 500 experimental animals, many of them tuberculous. Precautions were taken to rule out non-air borne infection. Lurie³ found that none of the guinea pigs thus exposed for a period of six months developed tuberculosis. Of the guinea pigs exposed for periods ranging from six to twelve months, 9.1 per cent developed a typical respiratory tract infection. Among those exposed for from twelve to eighteen months 27.7 per cent developed air borne tuberculosis. The morbidity increased to 35.3 per cent among those exposed for periods ranging from eighteen months to two years. Of the 20 guinea pigs that did not contract the disease by the end of two years only 1, or 5 per cent, was subsequently infected. Apparently under his method of exposure animals that do not develop tuberculosis by the end of twenty-four months have a hereditary or acquired resistance to subsequent infection.

Following the demonstration by Wells⁴ that pure cultures of tubercle bacilli suspended in air can be

killed within three seconds by exposure to ultraviolet light, Lurie⁵ and his associates developed a technic for testing the possibility of preventing natural air borne tuberculosis by ultraviolet rays. Two duplicate rooms were prepared. Each room contained a battery of individual cages for normal rabbits with a parallel group of cages for rabbits previously infected intravenously with highly virulent bovine type tubercle bacilli. These infected rabbits were shedding highly virulent tubercle bacilli in the urine. The two batteries were so placed that the natural air currents of the room were from the infected to the exposed rabbits. In the test room the space between the donor and recipient cages was flooded by ultraviolet light. No lamp was installed in the control room.

The recipients in each room were litter mates of the same highly inbred, genetically uniform rabbits. Three genetic strains were used: a hereditarily highly resistant rabbit family and two families of low hereditary resistance. Every two weeks each of the exposed rabbits was tested for acquired skin sensitivity, and every four weeks it was x-rayed. At the end of fifteen months all surviving exposed animals were killed and carefully examined, guinea pig inoculation being resorted to in case of the least doubt.

In a typical experiment (1942-43 series), 8 hereditarily resistant rabbits and 7 rabbits of the susceptible families were placed in each room. Within six to twelve months all exposed rabbits in the control room had developed a high degree of skin sensitivity. Twelve of the 15 had developed from 2 plus to 4 plus tuberculosis, of which 9 died. In the irradiated room no rabbit developed a positive skin reaction by the end of twelve months. But 1 ultraviolet room rabbit developed a questionable pulmonary lesion. From this lesion tubercle bacilli were isolated by guinea pig test.

Summarizing the results of three years' research, Lurie concludes that under the conditions of their experiments ultraviolet rays of high intensity completely protect all rabbits, whether of high or low natural resistance, from an air borne contagion so severe as to be fatal to the great majority of rabbits of the same genetic constitution if not protected by such radiation. The protected animals do not develop tuberculin sensitivity. With irradiation of low intensity, rabbits of high natural resistance are completely protected from acquiring demonstrable tuberculosis, though they do acquire tuberculin sensitivity. Low intensity irradiation, however, does not protect all rabbits of low natural resistance from acquiring lethal tuberculosis. From these encouraging results Lurie believes that "it is probable that ultraviolet radiation may control air borne contagion of human tuberculosis."

1. Topley, W. W. C.: *J. Hyg.* **19**: 350, 1920 1921

2. Perla, D.: *J. Exper. Med.* **45**: 209, 1927

3. Lurie, M. B.: *J. Exper. Med.* **51**: 743, 1930

4. Wells, W. F., and Lurie, M. B. *Ann. N. Y. Acad. Sci.* **34**: 21 (see B1 1941).

5. Lurie, M. B.: *J. Exper. Med.* **79**: 559 (June) 1944.

Current Comment

GRADUATE EDUCATION OF PHYSICIAN VETERANS

Elsewhere in this issue, page 709, appears a report on the graduate education of physician veterans which carries information of the greatest importance to all physicians now serving with the armed forces. Preliminary reports on the results of the questionnaire sent by the Committee on Postwar Medical Service to all physicians in the armed forces indicate that the majority of physicians wish graduate education, including short and long courses, in the postwar period. Under existing legislation physicians, like other veterans, are entitled to payment of tuition and also to cost of subsistence when engaged in such courses, subject to limitations which depend on the duration of the service and similar factors. A conference held by representatives of the Committee on Postwar Medical Service with representatives of the Veterans Administration and of the Vocational Rehabilitation and Education Service brought out the facts clearly.

GENERAL MEDICAL COVERAGE FOR INDUSTRIAL EMPLOYEES

Recently in *THE JOURNAL* a series of articles¹ was published describing some of the variations in approach which representative industries have made to the problem of general medical coverage for their member-employees. The Council on Industrial Health, in recognition of this trend, has adopted a statement of policy which should be helpful to physicians and medical societies faced with these developments. This statement, as approved by the Board of Trustees of the American Medical Association, is as follows:

Pressure is being placed on industry by management and by labor to extend the health services for which it is responsible. It has been recognized that industry has certain responsibilities in providing medical care for occupational injuries and diseases. These responsibilities have been extended to include various services in the field of preventive medicine. It is now proposed that industry provide over-all medical care for employees and their dependents, the term medical being used in a broad sense to include diagnosis and treatment in various special fields. The Council on Industrial Health believes that a statement along the following lines bearing the stamp of approval of the American Medical Association will be of assistance to physicians who are now confronted with this situation in many areas:

1. The principles on which medical care plans should be based have been defined by the House of Delegates of the American Medical Association. In developing medical care plans, industry should be in agreement with the local county medical society as to the conformity of such plans with these established principles. Plans of this nature should include provision for health maintenance programs.

2. Because of the essential medical nature of such plans, their policies should be directed and the medical phases should be controlled by the medical departments of industry.

3. The attention of industrial management should be directed to the place of the physician in industrial organization. The expanding importance of health activities in industry demands that the physician be responsible directly to top management and that activities relating to health be centered in and directed through the medical department.

THE DALLAS VENEREAL DISEASE CONTROL PROGRAM

A Venereal Disease Control and Educational Program was organized in Dallas, Texas, in the summer of 1943 at the suggestion of the commanding officers of the armed forces in that area. A report by the Dallas Venereal Disease Educational Committee¹ was issued on July 1, 1944. The Dallas program differs from the Chicago program² in that the Chicago program is a cooperative one in which the United States government, the state of Illinois and the city of Chicago are primarily concerned, whereas the Dallas program was carried out by two local committees, one on venereal disease control and the other on venereal disease education. The report outlines the procedures and describes the results. Pictures by the United States Army Signal Corps show the participation by community agencies and the public in the program. A typical double page spread layout shows a street corner with curb billboard, another billboard at factory gates, posters in a public waiting room, information on the inside of a washroom door, windshield stickers, car cards, a clinic scene, a dinner meeting and informational posters at soda fountains. Stickers were placed in juke boxes and elaborate exhibits displayed in public places. Films were used; these were seen by more than ninety-four thousand persons during the campaign. Fifty thousand water bills were stuffed with folders featuring venereal disease information. An active speakers' bureau, in which forty-four physicians participated, scheduled as high as three and four talks a day. Newspaper space was used to a total of 1,412 inches of paid advertising at a special rate lower than the regular advertising rate. In this program the people of Dallas got to work. The entire expense of the campaign was just over \$3,000, but this does not count the value of volunteer labor or the expense of materials received gratis from official agencies, especially the state health department. Results are indicated as follows: "A recent report by the medical director of the Eighth Service Command showed that the average rate of infection among military personnel for the three month period ending June 1, 1944 was 10.5 cases per week, a drop of more than 80 per cent as compared with the average weekly rate at the beginning of the campaign." A year is a short time in public health history. Doubtless this campaign, if continued, will show even greater results not only in the military but in the civilian population.

1. Adams, J. M.: *Stenococla Medical Care Plan*. J. A. M. A. 126: 333 (Oct. 7) 1944.
Bloom, M. S.: *Variations in Current Industrial Medical Service Plans*, *ibid.* p. 335.
Garfield, Sidney R.: *Health Plan Principles in the Kaiser Industries*, p. 337.
Jones, E. M.: *The Endicott-Johnson Plan*, p. 339.
McCam, James C.: *Medical Society Prepayment Programs. Lessons Learned from Experience in Massachusetts*, p. 341.
Wittmer, John J.: *Variations in Current Industrial Medical Service Plans*, p. 344.

1. Venereal Disease Control and Education in Dallas, Texas, 1943-1944, a report by the Dallas Venereal Disease Educational Committee, July 1, 1944.

2. Progress Report Chicago Venereal Disease Control Program 1942-1943. Board of Health, Chicago.

MEDICINE AND THE WAR

POSTWAR PLANNING

GRADUATE EDUCATION OF PHYSICIAN VETERANS

Report of the Subcommittee of the Committee on Postwar Medical Service

Dr. Frederick A. Collier, Dr. Walter Palmer and Father Alphonse M. Schwitalla, three members of the Subcommittee on Postwar Education of Physician Veterans, were accorded interviews with officials of the Veterans Administration on the afternoon of October 16. The other two members of the committee, Dr. Victor Johnson and Lieut. Col. Harold C. Lueth, found it impossible to attend.

The subcommittee called first on Dr. Charles M. Griffith in the office of the Medical Director, Veterans Administration Building, and after an exchange of courtesies was escorted by him to the office of Mr. Harold V. Stirling, Director, Vocational Rehabilitation and Education Service. Dr. Griffith explained that Mr. Stirling was in charge of the administration of title II of education of veterans of Public Law 346, 78th Congress, known as the "Servicemen's Readjustment Act of 1944" (the G. I. bill), and Public Law 16 was Mr. Stirling's responsibility.

Dr. Griffith explained that after the committee's interview with Mr. Stirling to learn from him the present status of Public Law 346 and its application to the physician veterans, he would discuss with the committee further the content and administration of the educational program itself which the Veterans Administration has projected or intends to project for the returning physicians.

I. ELIGIBILITY OF INSTITUTIONS

Mr. Stirling suggested that the committee discuss first the eligibility of institutions for recognition as educational centers in which veteran physicians might receive such educational benefits as are provided for under the law. He turned to section 400, part VIII, paragraph 4, and called attention to the fact that it is incumbent upon the administrator to

secure from the appropriate agency of each state a list of the educational and training institutions (including industrial establishments), within such jurisdiction, which are qualified and equipped to furnish education or training (including apprenticeship and refresher or retraining), which institutions, together with such additional ones as may be recognized and approved by the administrator, shall be deemed qualified and approved to furnish education or training to such persons as shall enroll under this part.

Mr. Stirling noted that the law distinguishes between institutions (giving training) "and establishments furnishing apprentice training on the job" (see paragraph 5). The institutions in which discharged physicians would receive their postdemobilization education, such as the hospitals, will, of course, qualify as institutions and will not be considered merely as "establishments furnishing apprentice training on the job."

To qualify as "institutions," the schools of medicine and the hospitals in which the returning physician will be further educated will have to appear by name on a list of educational and training institutions furnished by the appropriate agency of each state to the administrator. The administrator is given authority by the law to "recognize and approve" institutions on his own initiative. Obviously, however, the administrator will not undertake as a rule an approving or accrediting program and will rely on such lists as are furnished him by the appropriate agency of each state.

As far as medical education is concerned, there is very little difficulty about the schools of medicine,¹ since most, if not all, of the states would readily submit the names of schools recognized by the Council on Medical Education and Hospitals of

the American Medical Association. Much greater difficulty, however, will be found in supplying to the administrator a list of the recognized and approved hospitals, and a decision will have to be made concerning the list which all will agree will be the proper list to submit to the administrator. Mr. Stirling is of the opinion that it might be well if the administrator's office send to the governors of the various states such lists of institutions, schools and hospitals as are recognized and approved by appropriate agencies with the request to the governor to indicate his approval or disapproval of these lists as appropriate educational centers for the further education of the physician veterans under the program. Naturally, there are other outstanding problems concerning the eligibility of institutions which will need further discussion.

The important conclusion, however, is that in Mr. Stirling's opinion the schools and hospitals can be regarded as institutions within the intent and scope of the Servicemen's Readjustment Act of 1944, provided such institutions qualify under the provisions of paragraph 4, part VIII, title II, Public Law 346.

II. ELIGIBILITY OF INDIVIDUALS

"Any person who served in the active military or naval service on or after Sept. 16, 1940 and prior to the termination of the present war and who shall have been discharged . . . and whose education or training was impeded, delayed, interrupted or interfered with by reason of his entrance into the service . . . and who either shall have served ninety days or more . . . shall be eligible for and entitled to receive education or training under this part" (section 400, part VIII, paragraph 1). A number of provisions and limitations are included in the unquoted section of this paragraph but, in general, the substance of the provision is accurately given. Discharged servicemen under 25 years of age at the time they entered the service are assumed to have had their education impeded or delayed, while those 25 years of age or over at the time they entered the service will be expected to supply evidence that such a delay or obstacle to their education occurred.

With reference to the section just quoted, Mr. Stirling was of the opinion that any physician who is now in any of the branches of the service and has been on active duty for more than ninety days will be eligible for any of the benefits provided by the law. Even those who are more than 25 years old and desire refresher or other courses will no doubt be considered eligible even though they may have entered the Army at a time when their education might have been assumed as completed, since the law in providing refresher and retraining courses is naturally to be interpreted in a liberal spirit.

Any person who has been in active service for three months will be entitled to a period of one year of education or for such lesser time "as may be required for the course of instruction chosen by him." Those servicemen who have been in the service for more than the minimum period of three months may receive additional periods of education or training, the period "not to exceed the time such person was in active service on or after Sept. 16, 1940 and before the termination of the war." Periods during which a serviceman was receiving his education under the auspices of the Army or Navy while on active duty cannot be counted toward time credit for a prolongation of the educational period. The committee asked Mr. Stirling to apply this to the ordinary clinical residency. It was explained to him that the residencies in our hospitals, for example, were one, two or three years or more in length. He replied that:

Those in service three months are entitled to one year further education;

Those in service twelve months are entitled to two years further education;

Those in service twenty-four months are entitled to three years further education.

1. The problem of the state approved but not nationally approved schools of medicine was not touched on in this conference.

Intermediate periods of service entitle the serviceman to intermediately long periods of education, thus if a serviceman has served six months he is entitled to eighteen months of further education.

III TUITION AND FEE BENEFITS

The law provides that the administrator shall pay to the educational or training institution the tuition costs and fees as are customarily charged and may also pay for books, supplies and equipment and other necessary expenses, provided the payments with respect to any one person should not exceed \$500 for an ordinary school year. These payments are not to be paid to "establishments furnishing apprentice training on the job." The law provides that if the institution has no established tuition fee or if the administrator deems the established tuition fee to be inadequate compensation the administrator is authorized to provide for the payment. Again, however, with the \$500 ordinary school year limitation.

Applying these provisions of the law to the case of residencies in our hospitals and courses in our universities for our physician veterans, Mr. Stirling was of the opinion that there would be no difficulty about the payment of tuition and fees by the administrator for those physician veterans who elect courses in schools of medicine or for those who elect clinical courses in university hospitals where a formal program has been inaugurated. He was also of the opinion however that provided the hospital can be certified to the administrator by the appropriate state agency as a competent educational and training institution, the administrator may fix the tuition to be paid to such an institution under the provisions of the law (see last sentence section 400, title VIII, paragraph 5).

The arrangements heretofore in use in hospitals were explained to Mr. Stirling, it being pointed out that the hospital generally speaking not only did not charge tuition but actually offered the resident a stipend. He replied by saying that in his opinion if the hospital is certified as a bona fide educational institution the tuition for the physician veterans can be paid to that hospital even though the hospital still continues to pay a stipend to the veteran.

IV SUBSISTENCE BENEFITS

The law provides further that on application to the administrator the person taking courses shall be paid a subsistence allowance of \$50 per month if without a dependent or dependents or \$75 per month if he has a dependent or dependents.

This provision again Mr. Stirling believes, is applicable to the physician veterans who choose to take courses in medical schools or hospitals. Mr. Stirling is of the opinion, furthermore that the subsistence benefit may be paid the physician veteran even if he receives a stipend from the hospital, since in some cases the physician veteran will undoubtedly live outside the hospital and in many cases there will be a noticeable disproportion between the stipend paid by the hospitals and the salary level of the physician veteran before his discharge. It was pointed out, furthermore, that the subsistence benefit includes "regular holidays and leave not exceeding thirty days in a calendar year." There may still be some question whether the provisions of the law pertaining to attendance in courses on a part time basis and a corresponding part compensation for productive labor are applicable here but there seems no reason to anticipate an adverse ruling on this point. Furthermore, it should be noted that the administration has thus far defined a school year as thirty weeks for the purpose of administering the law, hence the tuition allowance of \$500 maximum can be made payable to the institution every thirty weeks if that is the interpretation and regulation under which the educational institution is operating. The subsistence benefit is not affected by the length of the school year.

V STATUS OF THE VETERANS ADMINISTRATION PHYSICIANS

The provisions of the Readjustment Act as summarized apply of course, to all institutions in which the physician veterans will expect to take courses, hence the committee asked Dr. Griffith whether in case the Veterans Administration opens its own hospitals to the physician veterans for refresher and retraining courses and for residencies, just what the status of these physicians would be.

Dr. Griffith explained that this is one of the outstanding problems which the Veterans Administration must face. At the present time the Veterans Administration physicians under a civil service status are full time appointees and at present there is no provision in the organization for residents. A graduate of a school of medicine who has had a good education, if appointed, enters the Veterans Service at a salary of \$3,200. After about eighteen months his salary is approximately \$3,800 while after ten to fifteen years he may reach a base salary of \$6,400. Clearly, the physician veterans if appointed to such positions would be in a particularly fortunate position at least with reference to salaries but obviously such an arrangement is not the one which is contemplated by the Servicemen's Readjustment Act. Just how this problem will be solved if the facilities of the Veterans Administration are offered for this educational program is not clear at the present time. A medical corps within the Veterans Administration would obviously solve the problem.

It is expected that within approximately five years the Veterans Administration will have 300,000 beds in about 150 institutions. At present the administration has about 1,800 physicians, approximately one fifth of whom are at the higher salary levels. This will give some indication of what might be expected in the future, but the Vocational Rehabilitation Program of the Veterans Administration will require many more physicians than would be indicated by the present physician to patient ratio. It would seem briefly, that it is highly desirable to establish an educational program within the Veterans Administration for the physician veterans so that these veterans may have the benefit of the unquestionably large and desirable facilities of the veterans' hospitals and secondly that the administration must make provision for a much larger physician personnel.

VI MEDICAL SERVICES OF THE VETERANS ADMINISTRATION

The committee was given the benefit of a further interview with Dr. Charles M. Griffith, Medical Director, and with Col. Hugo Mella, M. C., Assistant Medical Director, in charge of Postgraduate Instruction and Medical Research. Dr. Griffith explained the structure of the Veterans Administration emphasizing the extent and variety of the medical responsibilities of the administration. The medical director is responsible to the administrator through an assistant administrator. He has a number of assistant medical directors (at present five) who are in charge of various divisions namely general medicine and surgery, neuropsychiatry, outpatient and authorization tuberculosis and, lastly, postgraduate instruction and medical research. There are a medical executive officer and a medical consultant. The only medical activity of the administration which does not fall within the responsibility of the medical director is the medicolegal activity, namely the activity of physicians on various boards dealing with claims, adjustments and insurance.

Dr. Griffith and Colonel Mella then went on to speak of the various kinds of physician veterans in whom the Veterans Administration is interested. The first class is the discharged physician who qualifies for further education under the G. I. bill and who is adequately taken care of. The second group is the group of those who would like to qualify for an educational program in the Veterans Administration itself. The status of this group is not clear at the present time, since provisions must still be made for them. A third group of physicians might be those who would be discharged on the basis of physical disabilities and for whom both educational and other provisions will have to be made. If it was possible for the Veterans Administration to organize its own board and its own medical corps, many of the present difficulties with reference to medical care within the Veterans Administration could be promptly removed. At present the Veterans Administration has had assigned to it a number of physicians by the Surgeon General. Colonel Mella stated, after being asked that for the next two years he estimates that in the veterans' hospitals there should be place for approximately 250 residents. He estimates, furthermore, that 50 per cent of these could be employed in surgical residencies, 35 per cent in psychiatric and internal medicine resi-

dencies and 15 per cent in tuberculosis residencies. He called attention to the great difficulty under which the administration labors in developing an educational program arising from the fact that neither psychiatric nor tuberculosis hospitals have thus far been approved for residencies. By whom and when will such approval take place and what agency will undertake the definition of staff membership qualifications?

It is obvious that the Veterans Administration has given considerable thought to the organization and content of an educational program for physician veterans. Colonel Mella is studying the outline for graduate instruction in surgery as given to him by the College of Surgeons. He and his assistants are planning, moreover, to organize an appropriate committee in each of the

veterans' hospitals in which residents are to be instructed which will assume responsibility for the educational program, the committee to consist of the chief medical officer, the clinical director and the chiefs of the various services. The administrator has recently approved functional charts of organization for the various classes of facilities of the Veterans Administration, and, with such clear definitions as have been given, it should be a relatively simple matter to integrate with the existing functions the further function of education for our returning physician veterans.

FREDERICK A. COLLIER, M.D., Chairman.
WALTER PALMER, M.D.
ALPHONSE M. SCHWITALLA, S.J., Secretary.

ARMY

MEDICAL FIELD SERVICE SCHOOL AT CARLISLE BARRACKS

When a young man is enrolled in the medical department of the Army he is likely to be sent in the vast majority of cases to the Medical Field Service School at Carlisle Barracks, Pennsylvania. The school is located in Cumberland County at the foot of the Appalachian Mountains. It is about 18 miles from Harrisburg. The primary purpose of this school is instruction and training of officers of the medical department—essentially what is called indoctrination. The needs of war have brought about a condensation of the usual five months course to a six weeks period. In this time the student officer is instructed in tactics, the operation of medical units, preventive medicine, field sanitation and the application of medicine and surgery in the field. Included are practical demonstrations and participation in maneuvers. An officer candidate school for enlisted men of the medical department is carried on simultaneously.

Physical conditioning is an important part of the work and is intended to develop physical stamina, agility and coordination. This involves the usual marching, physical drill and the handling of litters carrying wounded. One area is set apart for actual demonstration of field sanitation. This area occupies 8 acres of ground. Here are shown all the different techniques for disposing of kitchen waste and human waste, for the control of lice, flies, mosquitoes and other insects, rat proofing, the preparation of water for use in the field, the disposal of sewage, the setting up of baths and many other sanitary measures. In the course of this work many new processes have been developed and are widely used in our armed forces.

In the mountain area closely associated with Carlisle Barracks, about 7 miles from the post, the medical officer learns how to read maps, set up medical installations for the transportation of the wounded and perform actually in the field many of the life saving procedures that he will have to do once he is in active service at the front. Furthermore, there is an infiltration course used to condition students mentally to the conditions of combat. Here the student gets out of a trench, crawls 80 yards, negotiates barbed wire obstacles, enters other trenches, and this with machine guns firing ammunition 36 inches overhead.

MEDICAL EQUIPMENT LABORATORY

The Medical Department Equipment Laboratory was established in 1920 by the Surgeon General of the U. S. Army and represents at this time one of the most fascinating museums of medical equipment to be found anywhere. Probably it is the only institution of its kind in the world. Here the visitors can see complete outfits of medical supplies for the operating room, the laboratory and the x-ray unit of the Japanese, Italian, German, French and other armies. Here are experiments in the development of light weight litters, operating units to be used in the field, motorized medical devices and innumerable other forms of apparatus. Here are models of ambulance trains and ambulance ships going back to the time of the Civil War and coming up to the latest of the devices available today. The dental equipment parallels that of medicine. When a need occurs anywhere among our troops in the air, on land or on the sea, a message sent to the Medical Department Equipment Laboratory puts the investigators to work and in the vast majority of instances they have been able to meet every request.

showing ingenuity that taxes the imagination. This laboratory is under the direction of Col. E. D. Quinnell, and any physician who has an opportunity to visit it and to study its content under the tutelage of Colonel Quinnell will be exceedingly well rewarded for his time and interest.

The textbook of Carlisle Barracks is the Instructors' Guide, a comprehensive work on the service of the medical department in war, written especially for the condensed course now being given. Here are all the details of defense against chemical warfare, mechanized warfare, air and parachute attack, hand to hand combat and what not. The significance of this instruction and training for the good of the nation and for the health and fitness of our troops is so great that one may anticipate a time in the postwar period when the six weeks condensed course may well be part of every medical curriculum.

NONCOMBAT DUTY TO SOLE SURVIVING SON IF TWO OR MORE BROTHERS HAVE BEEN KILLED

In recognition of the sacrifice and contribution made by a family which has lost two or more sons and has only one surviving, the War Department has approved a policy of returning to or retaining in the continental United States the sole surviving son of a family in cases in which two or more sons have been lost, except when the surviving son is engaged in nonhazardous duty overseas.

Sympathetic consideration will be given to every application in cases of families who have lost two or more sons and have only one surviving for return of the survivor to this country for duty here or for discharge from the Army, if the circumstances warrant. However, each case will be decided on its individual merits. In all cases of extreme hardship arising from family circumstances the Army has in the past cooperated to provide relief from active duty or discharge if the complaint has been found to have merit on investigation. The plan of removing men from the hazards of combat activity is an extension of this policy.

HOSPITAL NAMED IN HONOR OF COLONEL MADIGAN

The Madigan General Hospital, Fort Lewis, Washington, has been named in honor of the late Col. Patrick Sarsfield Madigan for his long and faithful service in the Army Medical Corps. At the time of Dr. Madigan's death in May of this year he was chief surgeon at Fort Belvoir, Virginia, Station Hospital. He graduated from Georgetown University School of Medicine, Washington, D. C., in 1912. Dr. Madigan began his army service in 1917, entering the Medical Corps and serving during the last war in France with the 7th Division. He was stationed in the Philippine Islands for two years and served four years in the Panama Canal Zone. In 1940 he was appointed medical adviser to the Surgeon General and the Adjutant General of the Army. Before going to Fort Belvoir in February he was commanding officer of Camp Lee, Virginia, Station Hospital. Col. A. P. Clark is commanding officer at the Madigan General Hospital.

MAJOR CLINTON S. MAUPIN A JAPANESE PRISONER

Major Clinton S. Maupin, formerly of Waurika, Okla., who has been a prisoner of war in Japanese prison Camp No. 1, Cabanatuan, Philippines, since he was captured on Bataan, recently sent a card stating that he is in excellent health and is looking forward to seeing his family again soon. Dr. Maupin graduated from the University of Oklahoma School of Medicine, Oklahoma City, in 1934 and entered the service Nov. 8, 1940.

ARMY AWARDS AND COMMENDATIONS

Captain John J. McCallig

Capt. John J. McCallig, formerly of Rochester, Minn., has been awarded the Purple Heart. Dr. McCallig was in the invasion on D day as a first surgeon, and three days later, at night, his hip was struck by an E boat torpedo in the Channel. His clothing and life-belt were torn from him by the blast, and he swam for an hour or more in the icy water until he found

a small raft, from which, two hours later, a British destroyer rescued him. Dr. McCallig graduated from the University of Oregon Medical School, Portland, in 1937 and entered the service July 12, 1942.

Major Paul L. Dent

Presentation of the Bronze Star Medal for meritorious service in combat was made recently to Major Paul L. Dent, formerly of Louisville, Ky., by Brig. Gen. Ralph H. Goldthwaite, commanding general, Army and Navy General Hospital, Hot Springs National Park, Ark. Dr. Dent, serving as operating surgeon in charge of a general surgical team in the Tunisian campaign, performed major surgery on battle casualties close to the front lines. His force and guidance in the speedy and successful care of seriously wounded battle casualties, despite serious difficulties and handicaps, contributed to the saving of the lives of several hundred men at his advance station. For his vital performance and pioneering the principles on which major surgery in the forward areas is now based, Dr. Dent was awarded the Bronze Star Medal. Dr. Dent graduated from the Medical College of Virginia, Richmond, in 1931 and entered the service in July 1942.

MISCELLANEOUS

CIVILIAN MEDICAL ATTENDANCE

Circular No. 214, recently issued by the headquarters of the Sixth Service Command, states that civilian medical attendance at public expense is authorized for military personnel while on a duty status or when absent on authorized leave, sick leave, furlough or pass only when the required attendance cannot be provided from available facilities of the Army or other federal agency. Other federal agencies include hospitals of the U. S. Navy, U. S. Public Health Service, Veterans Administration facilities and Indian hospitals. Prior authority for treatment of patients in these hospitals is not required.

Commanding officers sending patients to hospitals of other government agencies will send at the same time a letter requesting treatment of the patient, this letter to be signed by the responsible officer, and to give the information required by paragraph 4 c (1) AR 40-525. If the patient is admitted to the hospital while on pass, leave or furlough, or while absent without official leave, the responsible officer, on notice from the hospital of admission of patient, will write a request for treatment, covering information outlined in paragraph 4 c (2) AR 40-505.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

U. S. Naval Hospital, Philadelphia: Neoplasms in Service Personnel, Dr. Stanley P. Reimann, November 17; Practical Aspects of Psychosomatic Medicine, Dr. Louis J. Karnosh, November 28.

Bruno General Hospital, Santa Fe, N. M.: Address of Welcome, Brig. Gen. Larry B. McAfee. Symposium on Coccidioidomycosis: Introduction of subject, Major Samuel I. Kooperstein. Speakers, Dr. C. E. Smith, Major Norman Nixon, Lieut. Col. Brian Blades, November 16. Symposium on the Repair of Soft Tissue and Bone Defects of the Extremities: Introduction of subject, Lieut. Col. John D. Koucky. Speakers, Dr. Edward L. Compere, Dr. Earl C. Padgett, Major C. L. Robertson, Lieut. Col. W. W. Schuessler, November 16. Symposium on the Pathology of Tuberculosis: Introduction of subject, Lieut. Col. George J. Kastlin. Speakers, Col. Edmond R. Long and Col. Hugh Mahon, November 17. Symposium on Pulmonary Tuberculosis: Introduction of subject, Major George C. Owen. Speakers, Col. Edmond R. Long, Lieut. Col. Brian Blades, November 17. Symposium on Bone and Joint Tuberculosis: Introduction of subject, Major Frederick J. Fischer. Speakers, Dr. Edward L. Compere, Dr. Earl C. Padgett, Col. Edmond R. Long and Col. Hugh Mahon, November 18. Symposium on Chest Surgery: Introduction of subject, Lieut. Col. John D. Koucky.

Speakers, Lieut. Col. Brian Blades and other speakers not yet announced, November 18.

U. S. Naval Hospital, Long Beach, Calif.: Some Phases of Peripheral Nerve Surgery, Dr. R. B. Raney, November 18.

Mayo General Hospital, Galesburg, Ill.: Conditions Affecting Glucose Metabolism, Dr. Arthur R. Colwell, November 15.

Camp Ellis, Camp Ellis, Illinois: Dermatologic Diseases, Drs. Stephen Rothman, Robert M. Craig and George X. Schwemlein, November 15.

Chanute Field, Rantoul, Ill.: Low Back Pain, Drs. Fremont Chandler and Adrien H. P. E. Ver Bruggen, November 15.

PRISONERS OF WAR SERVICES

Through the cooperation of the American Red Cross, special optical, dental and orthopedic services are being provided for American prisoners of war. The American Red Cross reports that in all European prisoner camps the detaining power provides eye examination service. Prescriptions prepared by the camp optometrist are sent to Geneva, where a large pool of lenses has been established. When Geneva cannot fill the prescription it is filled elsewhere in Switzerland.

It was also reported that each camp usually has its own dentists: a German, American or another Allied dentist who is a prisoner. To meet shortages, dental supplies valued at about \$12,000 have been shipped to the International Committee of the Red Cross. When special dental treatment is needed it is paid for out of a revolving fund.

Temporary replacements are provided by their captors for prisoners who have lost a leg or an arm. The British and American Red Cross societies follow through by providing the best permanent mechanical limbs as soon as possible. To accomplish this a Swiss orthopedic mission visits all camps and measures the prisoners for artificial limbs. These are constructed in Switzerland for American prisoners at the expense of the American Red Cross.

WAXED PAPER FROM CIGARET CARTONS USED AS SURGICAL DRESSINGS

Capt. Richard A. Twyman, formerly of Rochester, Minn., discovered that waxed paper from the wrappers of cigaret cartons can be used for surgical dressings when the usual nonadherent substances are unavailable. Holes are punched at quarter-inch intervals to permit drainage and irrigation. The waxed papers are washed with soap and water, placed in a shallow pan, wrapped like other surgical dressings and then sterilized in the usual manner. Dr. Twyman graduated from Northwestern University Medical School, Chicago, in 1938 and entered the service June 19, 1943.

ORGANIZATION SECTION

Official Notes

CHANGE 1945 ANNUAL MEETING PLACE

The House of Delegates of the American Medical Association at the annual session held in 1942 selected New York City as the place of meeting for the 1945 annual session. Certain preliminary arrangements were completed, but investigations recently made in New York clearly indicate that the necessary facilities will not be available in that city in 1945 because of conditions created by the war emergency. It is with regret that it is necessary to make the announcement that the annual session scheduled for New York, June 11 to 15, 1945, will have to be held in some other city where adequate facilities will be available. Under the direction of the Board of Trustees necessary investigations are now in progress and definite announcement as to the place of meeting for 1945 will be made through the columns of THE JOURNAL at the earliest possible time.

ANNUAL CONFERENCE OF STATE SECRETARIES AND EDITORS

The Annual Conference of Secretaries and Editors of Constituent State Medical Associations will be held at the offices of the Association in Chicago on November 17 and 18. The program will be as follows.

FRIDAY, NOVEMBER 17, 10 A. M.

Call to Order James R. Bloss, Chairman of the Board of Trustees of the American Medical Association
Address Herman L. Kretschmer, President of the American Medical Association
The Functions and Operations of the Bureau of Information Lieut. Col. Harold C. Lueth, Army Medical Corps Liaison Office
The Council on Medical Service and Public Relations John H. Fitzgibbon, Chairman of the Council
12:30 p. m. LUNCHEON

FRIDAY, NOVEMBER 17, 2 P. M.

Address Roger I. Lee, President Elect of the American Medical Association
The EMIC Program E. D. Phiss, State University of Iowa College of Medicine, and Thurman B. Rice, State Health Officer of Indiana
Medical Service Plans Robert E. S. Young, Member of Medical Service Committee of Ohio State Medical Association

FRIDAY, NOVEMBER 17, 6:30 P. M.

DINNER MEETING OF EDITORS OF STATE MEDICAL JOURNALS
PALMER HOUSE, ROOM 14 CLUB FLOOR
W. R. Brooksher, Editor of the *Journal of the Arkansas Medical Society*, presiding
Our State Journals as Molders of Opinion Herman M. Jahn, Editor of the *Nebaska State Medical Journal*
Attitude of State Medical Journals Toward Political and Social Trends That May Affect Medical Affairs Creighton Barker, Secretary of the Connecticut State Medical Society
Our State Journals as News Services E. M. Shanklin, Editor of the *Journal of the Indiana State Medical Association*

SATURDAY, NOVEMBER 18, 9:30 A. M.

Medical Attitudes Opportunities and Responsibilities in a National Fitness Program J. W. Wilce, Ohio State University, and Member of Official Group of National Committee on Physical Fitness
Radio Broadcasting by Medical Progress A. S. Brunk, President of the Michigan State Medical Society

COUNCIL ON MEDICAL SERVICE WASHINGTON OFFICE

The Washington Bureau of the Council on Medical Service is preparing a list of state association officers and the names of members designated to cooperate with it in the winter's work. The list is about complete, only a few states remaining to be heard from.

The director, Dr. Joseph S. Lawrence, has met with the county legislative chairmen of Indiana at a conference held in

Indianapolis and also with the County Secretaries' Association of Wisconsin at its annual meeting.

The council has had the first of its regional meetings held Sunday, October 29, in Cincinnati. Four states—Ohio, Indiana, Kentucky and West Virginia—composed the region and more than eighty physicians were in attendance. Dr. Edward J. McCormick, a member of the Council, presided, assisted by the three trustees, Drs. Bloss, Sensemich and Henderson, who reside in this district. The two subjects that commanded the most interest were the Council's program and the plans for prepayment insurance. The next regional conference will be held in Washington on December 6 and a third is scheduled for St. Paul on December 10.

Washington Letter

(From a Special Correspondent)

Nov. 6, 1944

Action Promised on Capital Hospital Center Bill

Despite authorized extensions to local hospitals, efforts will be pressed immediately after the November 7 election to pass the bill to establish a 1,500 bed hospital center in the District of Columbia. Senator Millard E. Tydings (Democrat, Maryland) heads a special subcommittee of the Senate District Committee, which was created to study the measure and hold public hearings on it. He sponsored the bill in the Senate and says that every effort will be made to enact it. A companion bill was introduced in the House by Representative Thomas D'Alesandro (Democrat, Maryland) and is pending. The federal government would bear the entire cost of the proposed medical center. It would be operated on a nonprofit basis by participating private hospitals, with Emergency and Garfield Hospitals forming the nucleus.

Senator Tydings said that the cost of the center was estimated at between \$5,000,000 and \$7,500,000. The center would be equipped with the most modern scientific devices and staffed with the best medical personnel available. The Senate bill has been given the first position on the Senate District Committee calendar, according to Senator Theodore G. Bilbo (Democrat, Mississippi), chairman.

Robert H. Felix New Mental Hygiene Chief, Mental Hygiene Division, U. S. P. H. S.

Appointment of Dr. Robert H. Felix as medical director in charge of the Mental Hygiene Division in the Bureau of Medical Services, U. S. Public Health Service, has been announced by Dr. Thomas Parran, Surgeon General. Dr. Felix relieves Dr. Lawrence Kolb, who retired October 31. A well balanced program of the advancement of mental health in the United States was described by Dr. Felix as his first effort on taking over his new post. He cited present needs for expansion of research and a nationwide extension of psychiatric services to apply the findings of research to the psychic problems of people. Dr. Felix was borne in Downs, Ky., May 29, 1904, received his degree in medicine at the University of Colorado in 1930 and interned at the Colorado General Hospital in Denver. He was granted a two year fellowship by the Commonwealth Fund and took his postgraduate training at the Colorado Psychiatric Hospital under Dr. Franklin R. Ebaugh. He was commissioned in the regular corps of the Public Health Service in August 1933 and had a varied experience in the service. He developed and operated a mental hygiene service for the Coast Guard at New London, Conn., with the advent of war. He is a Fellow of the American Medical Association, the American College of Physicians and the American Psychiatric Association, a member of the Association of Military Surgeons and the Southern Psychiatric Association and a past president of the Kentucky Psychiatric Association.

Toxicity of DDT Described by Dr. Paul A. Neal

In spite of its inherent toxicity, DDT in the desired insecticidal concentrations in the air is of such low order that it will not cause injurious effects on human beings, said Dr. Paul A. Neal of the U. S. Public Health Service in his address to the National Museum Entomological Society here. He reported that studies conducted at the Industrial Hygiene Research Laboratory of the National Institute of Health in Bethesda, Md., showed that DDT in concentrations up to 10 per cent in inert powders for dusting clothes, as in the extermination of lice, offers no serious health consequences. The use of a 15 DDT deobase mist mixture had no toxic effect on rabbits, and it should be safe to use as a fly spray. In a clinical and laboratory study of 3 men who had had several months' continuous occupational exposure to DDT in its various forms as an insecticide, an evaluation of results failed to indicate any definite toxic effects from exposure to DDT. Although this study dealt only with the appraisal of the potential dangers of DDT when inhaled as an aerosol, dust or mist, Dr. Neal pointed out that massive doses either by mouth or by skin absorption will cause toxic reactions. Heavy contamination of foods should be avoided.

National Hospital Service Society Ordered Dissolved

Dissolution of the National Hospital Service Society, Inc., of Washington, D. C., fraternal organization providing hospitalization insurance and medical care for 5,000 District of Columbia residents, was ordered by the federal government on technical charges of violating insurance laws. District Court Justice F. Dickinson Letts consented to transfer of the five thousand policies to National Hospitalization, Inc., in Maryland. Attorneys for National Hospital Service Society state that its members do not face any loss of money or insurance benefits. Justice Letts signed a consent decree through which Cornelius H. Doherty and Louis M. Denit, attorneys, agreed to revocation of the organization's charter and dissolution of the business effective Jan. 15, 1945. U. S. Attorney Edward M. Curran and his aide Daniel B. Maher said that under terms of the charter the society was a fraternal and benefit association required to carry on its business for the sole benefit of members and beneficiaries and not for profit. The government, however, charged that the society conducted its business for profit and issued policies that did not carry death benefits and which did not require medical examinations. Such provisions were ordered for potential policyholders under the terms of the charter. The organization was founded in 1935.

Named to Joint Committee on Physical Fitness

Chairman John B. Kelly of the National Committee on Physical Fitness of the Federal Security Agency announced here that Capt. Raymond Wells, U.S.N.R., and Dr. Lon W. Morrey have been appointed to the committee as representatives of the American Dental Association. Dr. Wells is a past president of the American Dental Association, and Dr. Morrey is a member of its central office staff.

Society Proceedings**COMING MEETINGS**

- American Society of Anesthetists, New York, Dec. 14. Dr. McKinnie L. Phelps, 745 Fifth Ave., New York 22, Secretary.
- Annual Conference of State Secretaries and Editors, Chicago, Nov. 17-18. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.
- New York State Association of Public Health Laboratories, Albany, Nov. 17. Miss Mary B. Kirkbride, New Scotland Ave., Albany 1, Secretary.
- Puerto Rico, Medical Association of, Santurce, Dec. 15-17. Dr. E. Martinez-Rivera, P. O. Box 3866, Santurce, Secretary.
- Southern Medical Association, St. Louis, Mo., Nov. 13-16. Mr. C. P. Loran, Empire Building, Birmingham 3, Ala., Secretary.
- Southern Surgical Association, Hot Springs, Va., Dec. 5-7. Dr. Alfred Blalock, Johns Hopkins Hospital, Baltimore 5, Secretary.
- Western Surgical Association, Chicago, Dec. 1-2. Dr. Arthur R. Metz, 250 East Superior St., Chicago, Secretary.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Changes in Health Personnel.—Dr. John I. Mitchell, Double Springs, health officer of Winston County for three years, has resigned effective October 1 to enter private practice either in Russellville or in Pell City, it was reported. —Dr. Frank M. Hall, Athens, has been named health officer of Alachua County, Gainesville, Fla.

ARIZONA

State Meeting to Be in Tucson.—The Arizona State Medical Association will hold its annual meeting at the Pioneer Hotel, Tucson, April 27-28, 1945. The scientific program will be presented by members of the staff of Baylor University College of Medicine, Houston, Texas.

CALIFORNIA

Symposium on Psychotherapy.—The San Francisco Psychoanalytic Society held its semiannual meeting October 28-29 at the Ambassador Hotel, Los Angeles. One session was a symposium on short psychotherapy with Comdr. Uno H. Helgesson (MC) on "Experiences with Short Psychotherapy in Military Psychiatry"; Dr. Bernhard Berliner, San Francisco, "The Practice of Short Psychoanalytic Psychotherapy," and Drs. Otto Fenichel and Ernst Simmel, Los Angeles, "Theoretical Considerations of the Indications, Limitations and Technic of Short Psychotherapy." Other speakers include Drs. Emanuel Windholz, San Francisco, on "The Possibilities and Limitations of Group Psychotherapy" and Jacob S. Kasanin, San Francisco, "Vestigial Roots of Schizophrenia."

State Board Activities.—Superior Judge Emmet H. Wilson on September 12 upheld an order of the Board of Osteopathic Examiners revoking the license of Leslie R. Nunn, osteopath, on charges that he aided an unlicensed person in performing a tonsillectomy on 2 boys who died following an operation (THE JOURNAL, Oct. 23, 1943, p. 495). According to the Los Angeles Examiner, September 13, Nunn had asked for a writ of mandate compelling the board to vacate its order revoking his license as a "physician and surgeon" and charged that the board accepted evidence without his knowledge. Nunn and Harry Navarre, a chiropractor, are now in San Quentin serving terms for the deaths of 2 children who were operated on by them, it was stated.—The San Jose Mercury Herald, September 16, reported that probation had been granted to William G. Cardew, chiropractor and confessed abortionist. The period of the probation, which is the second in two years, is for five years. Superior Judge William F. James, in addition to making surrender of the license and abandonment of practice, equipment and drugs conditions of the probation order, also stipulated that Cardew's premises be opened for inspection at all times by county or medical authorities. Another chiropractor, Max Otto Garten, Salinas, was reported on September 17 to have been released on \$2,000 bail following his arrest on a charge of performing an illegal operation.

DELAWARE

Society News.—Dr. Percy F. Pelouze, assistant professor of urology, University of Pennsylvania School of Medicine, Philadelphia, addressed the New Castle County Medical Society of Delaware, Wilmington, October 17, on "Gonorrhea and Its Treatment." Col. Arthur P. Hitchens, M. C., discussed "Public Health and the Practicing Physician" before the society on September 19.

DISTRICT OF COLUMBIA

Dr. Ruffin Honored.—Dr. Sterling Ruffin, professor emeritus of medicine, George Washington University School of Medicine, was honored when the October issue of the George Washington University news bulletin was dedicated to him. The news bulletin is entitled "Confidential—from Washington" and contains a tribute by Cloyd H. Marvin, LL.D., president of the university, in which he declares that Dr. Ruffin, "as a distinguished practitioner and able teacher of medicine, has contributed greatly to the medical school and through it to the Washington community." Dr. Ruffin graduated at the medical school in 1890, serving as professor there from 1902 to 1924, when he became emeritus.

ILLINOIS

Postgraduate Conference.—The Postgraduate Conference of Northern Illinois will be held at the Faust Hotel, Rockford, November 15. Among the speakers will be:

Mr. John W. Neal, secretary, committee on medical service and public relations, Illinois State Medical Society.
Dr. William H. Cassels, Chicago, Anesthetic Emergencies.
Dr. Robert S. Berghoff, Chicago, Heart Clinic with Demonstration of Patients.
Dr. Henry G. Poncher, Chicago, Management of Rheumatic Fever.
Lieut. Col. Orla W. Steks, M. C., Penicillin: Its Practical Applications, with Case Reviews.
Lieut. Col. Earl R. Denny, M. C., Use and Abuse of Sulfa Drugs.

New Ruling on Boric Acid.—Dr. Roland R. Cross, Springfield, state director of public health, has requested hospitals in the state to eliminate boric acid from the inventory of drugs and other preparations kept on hand for use in the maternity divisions of the hospitals. The action was taken on the ground that boric acid is of very little, if any, antiseptic value but is highly toxic when ingested by infants. The request followed the death of 2 infants in an Illinois hospital attributed to boric acid poisoning. "The infant deaths reported from various hospitals throughout the country as due to boric acid poisoning have had their origin in the accidental substitution of boric acid powder for dried milk products or of the accidental substitution of weak boric acid solution for distilled water in the preparation of infant food formulas. Carelessness, improper labeling of bottles and shifting personnel seem to be contributory factors" Dr. Cross announced.

Chicago

Personal.—Dr. Louis J. Halpern has been appointed assistant professor of pediatrics at the University of Illinois College of Medicine.—Mrs. Adaline Hayden has been appointed executive secretary of the American Association of Medical Record Librarians, effective October 23. Her headquarters will be in the office of the American Hospital Association, 18 East Division Street.—Dr. Orpheus W. Barlow, formerly director of research laboratories of Winthrop Chemical Company, has been appointed medical and research director of Nutrition Research Laboratories. Dr. Barlow graduated at Rush Medical College in 1936.

Memorial Service for Dr. Besley.—A memorial service for the late Dr. Frederic Atwood Besley, Waukegan, will be held under the auspices of the American College of Surgeons in Memorial Hall, 50 East Erie Street, November 19, at 3 p. m. Dr. Irvin Abell, Louisville, Ky., chairman of the board of regents of the college, will preside. Taking part in the program will be Rev. Howard E. Ganster, Rector, Christ Episcopal Church, Waukegan; Dr. Irving S. Cutter, emeritus dean, Northwestern University Medical School; Major General Robert U. Patterson, M. C. (retired), Baltimore, formerly surgeon general of the Army; Dr. Gilbert T. Thomas, Los Angeles, regent, American College of Surgeons, and Dr. Donald C. Balfour, Rochester, Minn., associate, editorial staff, *Surgery, Gynecology and Obstetrics*. Dr. Besley, at the time of his death on August 16, was secretary of the American College of Surgeons, of which he was a founder-fellow in 1913.

Tumor Diagnostic Service Inaugurated.—The University of Illinois College of Medicine and the division of cancer control of the state department of public health are cooperating in a new tumor diagnostic service at the Research and Educational Hospitals, Chicago. The operation of this service under these joint auspices provides for an augmentation of the facilities offered by the tumor clinic of the medical college, which has been conducted for some time under the direct supervision of Dr. Danely P. Slaught, assistant professor of surgery at the medical school. The activities of the state division of cancer control are under the direction of Dr. Raymond V. Brokaw, chief of the division. These facilities are available to all practicing physicians throughout the state as a consultation service in the care of their suspected cancer cases. Patients who can afford to pay will be diagnosed and returned to their referring physician with recommendations for treatment. Medically indigent patients who are approved by the social welfare department of the hospital will be treated without charge in accordance with the customary policy. Tumor clinic sessions are held on Tuesdays, Wednesdays and Fridays from 2 to 5 p. m. Ambulant patients will be admitted to the clinic on any of these days, but cases requiring hospital care will be received only by previous arrangement and to the extent of available facilities. Additional tumor diagnostic services now operated under the auspices of the division of cancer control are located at St. Anthony's Hospital, Rockford; Burnham City Hospital, Champaign, and Memorial Hospital, Springfield. At all of these services specimens of

suspected tumor tissue from medically indigent patients which may be submitted by physicians from any part of the state are accepted for microscopic examination and diagnosis without charge. Suitable containers for mailing such specimens are available upon request. Further information regarding these facilities may be obtained by addressing the Division of Cancer Control, 505 South 5th Street, Champaign, or the director of any of the services named.

INDIANA

Personal.—Dr. David A. Boyd Jr., professor of psychiatry, Indiana University School of Medicine, Indianapolis, has been made the first full time director of the neuropsychiatric ward of the Indianapolis City Hospital.—Dr. Charles A. Miller, Princeton, has been appointed health officer of Gibson County, succeeding the late Dr. Bertis C. Gwaltney, Fort Branch.—Dr. Karl R. Luthy, formerly of Paducah, Ky., has been named medical director of the U. S. Rubber Company plant in Mishawaka.

LOUISIANA

Dr. Bayley Goes to Oklahoma.—Dr. Robert H. Bayley, associate professor of medicine, Louisiana State University School of Medicine, New Orleans, resigned September 1 to become professor of medicine at the University of Oklahoma School of Medicine, Oklahoma City.

MARYLAND

Evander F. Kelly Dies.—Evander F. Kelly, Phar.D., a member of the Maryland State Department of health since 1920 and secretary of the American Pharmaceutical Association, died at his home in Texas, Baltimore County, October 27. Dr. Kelly had been dean of pharmacy at the University of Maryland from 1918 to 1926, when he became advisory dean. In 1933 he won the Remington Medal of the American Pharmaceutical Association.

Emmett Holt Goes to New York Medical College.—Dr. L. Emmett Holt Jr., since 1930 associate professor of pediatrics at Johns Hopkins University School of Medicine, Baltimore, has been appointed professor of pediatrics at the New York University College of Medicine and director of the pediatric service at Bellevue Hospital. Dr. Holt graduated at Johns Hopkins in 1920 and has been a member of the staff there since 1922. He was president of the Society for Pediatric Research in 1939.

MICHIGAN

Bequest for Cancer.—About one million dollars of the estate of Mrs. James T. Pardee, Midland, is to be used for the control of cancer under her will, the *New York Times* reported October 12.

Personal.—Dr. John H. Law, formerly assistant director of Grace Hospital, Detroit, has been named director, succeeding the late Dr. Edmund F. Collins.—Dr. Milton H. Erickson, assistant professor of psychiatry at Wayne University College of Medicine, Detroit, has recently been promoted to associate professor of psychiatry.—Dr. Henry J. Pyle, Muskegon, has resigned as school physician of Muskegon, a position he has held for the past twenty-four years.

State Division of National Physicians Committee.—The Michigan Division of the National Physicians Committee for the Extension of Medical Services was organized at the Book-Cadillac Hotel, Detroit, October 11. Dr. Clarence E. Umphrey, Detroit, who has served for a number of years as chairman of the Metropolitan Detroit Group, was unanimously elected chairman of the state committee, which will now absorb the former Metropolitan organization. Other officers chosen include Drs. William M. LeFevre, Muskegon, vice chairman; Eldwin R. Witwer, Detroit, secretary, and Wyman D. Barrett, Detroit, treasurer. These officers will consider the appointment of an executive secretary.

Scholastic Prizes.—The Distinguished Service Award of Wayne University College of Medicine, Detroit, was presented during the recent commencement to Dr. Kenneth E. McIntyre as the "student outstanding in scholastic and extracurricular activities." Dr. Donald E. Preshaw received the Alumni Award, presented to the student who has maintained the highest scholastic standing during his four years in college. The Theodore A. McGraw Memorial Award, given to the outstanding student of the junior year, went to Peter J. Talso. This prize was given to Dr. Preshaw during his junior year. Arthur D. Harris and Dr. Addison E. Prince received the H. Peyton Johnson scholarships, presented annually to Negro medical students of high ability and character. The Angus McLean Memorial Award, for the graduate student who has done the best research work during the year, went to Dr. Robert O. Bauer.

NEW HAMPSHIRE

Health Program at Colby College—Seventeen physicians conducted an annual health clinic at the Colby Junior College, for women, New London, October 21, examining the 190 entering students and reviewing the cases of returning students whose previous health records have not been perfect. Serving as the basis for the clinical work are the records presented by the student's family physician and results of the college's preliminary examination covering chest x-ray, hemoglobin test, heart rate, blood pressure, Wassermann test, urinalysis, blood analysis and audiometric reading. Following her examination each student meets with one of the conference physicians to clear up any questions and to determine her health program for the year. Where necessary appointments are made at neighboring clinics and hospitals for psychiatric treatment and dental work. In preparation for the clinic three medical technicians graduates of Colby, have worked at the New London Hospital for two days to analyze specimens and to complete Wassermann tests. Undergraduates in the medical technician and medical secretarial courses receive practical experience at the clinic in making records and otherwise assisting the doctors. In addition to its purpose in preventing disease and discovering physical weaknesses the clinic is considered an effective educational measure in that it familiarizes students with complete, efficient and modern medical methods and, through the personal doctor-student conference, gives them an opportunity to gain the maximum knowledge from the experience. The estimated expense to the college for the one day clinic is approximately \$2,000. The college stresses the importance of student, faculty and staff health throughout the year. Faculty, housekeepers and groundsmen are required to pass a complete physical examination at least every three years, while food handlers must undergo an annual examination that is thorough in every respect and designed to discover carriers of infection. A daily clinic is held every morning for students to check on slight illnesses and to segregate immediately those who need hospitalization in the college infirmary.

NEW YORK

Another Medical Plan—At a meeting October 17 the Medical Society of the County of Monroe voted to launch the Genesee Valley Medical Care Inc., a nonprofit medical insurance plan for residents of the Rochester area. The name was selected to make the plan broad enough to attract medical persons in the area but outside Monroe County. A board of ten directors and two others to be named by the president of the society, Dr. Benedict J. Duffy, Rochester, will work with six lay members of the board of directors in planning details to submit to interested agencies.

Meeting of Public Health Laboratories—The New York State Association of Public Health Laboratories will meet at the state laboratory, Albany, November 17. Among the speakers will be

- Dr. William Kaufmann, Albany, Laboratory Aids in the Diagnosis of Amebic Colitis in Temperate Climates
- Dr. Nathan Mitchell, Albany, Latent Primary Carcinoma of the Thyroid Gland
- Dr. Frank W. Foote Jr., Albany, Mucoepidermoid Tumors of Salivary Glands
- Dr. Max M. Strumler, Bryn Mawr, Pa., Fractionation of Blood with Specific Reference to Modified Globin

On November 16 the association will sponsor its fifth conference on tropical diseases in cooperation with the division of laboratories and research of the state department of health. Participating will be Dr. George M. Lewis, New York, who will discuss "Clinical and Immunological Aspects of Fungus Infection" and Rhoda W. Benham, Ph.D., New York, "Laboratory Procedures in the Diagnosis of Fungus Diseases."

Resources to Be Pooled in Poliomyelitis Care—A plan is under consideration in New York State whereby personnel resources can be pooled to meet the need for postacute and convalescent care of victims of this year's outbreak of infantile paralysis. At a meeting of hospital administrators called by the state department of health, September 26, Dr. Edward S. Rogers, assistant commissioner for medical administration, stated that the estimate of cases in upstate New York will reach 4,000 by the end of the present outbreak, now past its peak, equaling the figure for the epidemic of 1916. According to *Health News*, publication of the state department of health, this does not hold true for New York City, the expected total for which is 1,800 cases, only about one fifth of the number experienced in 1916. The group attending the meeting expressed serious concern over the problem in future months of providing the facilities required to meet upstate demands and a resolution was approved providing for the appointment of a state commissioner of health of an advisory coordinating committee to consist of three representatives of each of

the following groups: the Hospital Association of New York State, the New York State Association of Institutions for the Physically Handicapped and the New York State Department of Health. A function of the committee will be, among other things, to evaluate the needs of the postepidemic poliomyelitis period and to make recommendations to the commissioner of health concerning the allocation of personnel and patients to institutions qualified to care for such patients.

New York City

The Harvey Lecture—Selman A. Waksman, Ph.D., microbiologist, Agricultural Experiment Station, State of New Jersey, New Brunswick, will deliver the second Harvey Society Lecture of the current series at the New York Academy of Medicine November 16. His subject will be "Production and Nature of Antibiotic Substances."

Industrial Hygiene Courses—A series of one week courses in the medical, surgical and dental aspects of industrial hygiene opened at the DeLamar Institute of Public Health, Columbia University, October 30, and will continue to December 16. The program is designed to aid in the institute's expanding plan for teaching, practice and research in various aspects of public health. Studies in diagnosis and control of dermatoses began October 30. Other courses will be on general health in industry, to start November 13, the use of plasticizers and solvents in industry and their toxicologic aspects, November 20, metals and their industrial uses and dangers, November 27, and the administrative aspects of industrial hygiene, December 4. Dental problems and practices in the field of industrial hygiene will be the subject of the final course in the series, to begin on December 11.

Rehabilitation Project—The Hospital for Joint Diseases and the New York City Vocational Rehabilitation Bureau have worked out a joint program directed toward the early vocational rehabilitation of patients known to that hospital. The plan calls for an analysis of the social and vocational needs of the patients based on the medical survey, diagnosis and prognosis before patients are discharged from the hospital. Consideration will be given as to whether a patient can return to his former job, whether he requires assistance in returning to his previous job or work environment, whether he requires counseling and guidance in his job adjustment or whether he requires training or retraining toward a job objective. Where patients are discharged from the hospital to continue under medical care, consideration of medical, social and vocational needs of the patient will continue after his discharge from the hospital until the plan for the patient is fulfilled. This early consideration will aim to balance the patient's physical and psychologic capacity to the demands of the training and retraining program and the job objective as outlined. The project is under the direct guidance of the medical board which has assigned several of its members to the rehabilitation committee. In this project, in which the doctors will take leadership, all departments of the hospital will be involved including medical, nursing, social service, occupational therapy and physical therapy. The New York City Vocational Rehabilitation Bureau has assigned a member of its staff to the joint rehabilitation project who is serving at the hospital.

Postwar Plans Feature Dinner for Physicians—A dinner was held at the Hotel Roosevelt, October 26, celebrating the seventieth birthday of Drs. Samuel A. Brown, formerly dean of the New York University College of Medicine and George B. Wallace, professor of pharmacology at the college. The occasion also observed the many years of service of both physicians, Dr. Brown having been associated with the college since 1896, two years after his graduation there, and Dr. Wallace who has been associated with the teaching faculty since 1901. Dr. Brown served as dean from 1915 to 1932. He is currently chairman of its council committee on medicine and dentistry. Harry Woodburn Chase, LL.D., chancellor of the university, as a guest speaker, announced extensive postwar plans for the development of a medical-dental center in the Bellevue area by the New York University College of Medicine in cooperation with the city of New York and Bellevue Hospital. The plans would include a university hospital and diagnostic clinic which would offer all methods of modern diagnosis together with inpatient facilities to families of the middle-low income group, an institute of medical sciences where the clinical departments of medicine can offer opportunities to younger men for study and research in specially important fields and a general unit which would comprise the medical library, hall of residence and a large auditorium for postgraduate teaching to seat 500. In announcing the proposed plans, Dr. Chase paid tribute to Dr. Brown and Dr. Wallace for their efforts in the development of the New York University College of Medicine.

OREGON

Frank Menne Retires as Professor of Pathology.—Dr. Frank R. Menne, since 1916 associated with the University of Oregon Medical School, Portland, has resigned as professor and head of the department of pathology. He has been succeeded by Dr. Warren C. Hunter, a member of the staff of the school since 1925. Dr. Menne graduated at Rush Medical College in 1915, going to Oregon the following year to become assistant professor of pathology. He was named professor in 1920 and head of the department in 1929. Dr. Hunter graduated at Oregon in 1924, joining the faculty the following year as assistant professor of pathology. He was named professor in 1941.

RHODE ISLAND

Fraudulent License Revoked.—On August 9 the state board of medical examiners revoked the license to practice medicine issued to Charles Jacobson, 984 Broad Street, Providence. Appeal by Jacobson subsequent to this action serves as a stay of the revocation until the case is disposed of by the supreme court. The state board of medical examiners contends that Jacobson obtained his license to practice through fraud and deceit. It is reported that there is no evidence to prove that Jacobson had taken and passed his state examination in 1934 as he claimed, and members of the board testified that they did not recall that he took the examination. A physician testifying at the trial, who took the examination in question, testified that he did not see Jacobson present at the time and that Jacobson later came to him and asked him to state that he had seen the latter take the examination. Information concerning Jacobson shows that he graduated at the Middlesex College of Medicine and Surgery, Waltham, Mass., in 1932 and served an internship at the Miriam Hospital, Providence, from July 1932 to July 1933. He is reported to have taken the Massachusetts State Board examinations in 1934 and 1935, failing to pass in either of them.

SOUTH CAROLINA

Changes in Health Officers.—Dr. Robert D. Hicks, director of the York and Chester district health department, has also been placed in charge of the unit at Cherokee County with headquarters in Chester.—Dr. James N. Holtzclaw, director of the Greenville County Health Department, has been given jurisdiction over the unit in Laurens County.

Young Physician Wins Ravenel Cup.—Lieut. (jg) Harry Boatwright (MC), who graduated at the Medical College of the State of South Carolina, Charleston, September 16 and who has received a commission in the U. S. Naval Reserve, was during his graduation exercises presented with the Ravenel Cup for his thesis in the field of public health. The cup is awarded annually by Dr. Mazyck P. Ravenel, formerly of Charleston and now emeritus professor of medical bacteriology and preventive medicine in the University of Missouri School of Medicine, Columbia.

TEXAS

Proposed Expansion Program at State Medical School.—Chauncey D. Leake, Ph.D., dean and executive vice president, University of Texas School of Medicine, Galveston, recently recommended a long range expansion program estimated to cost about four million dollars to meet the physical needs of the school of medicine. The recommendations were contained in a report to the medical committee of the board of regents of the university and include an addition of the main laboratory building to cost \$1,000,000, a library auditorium and general administration building \$300,000, and a building for a school of public health which, according to the state medical journal, probably could be housed in the main building of the medical college if other departments are transferred. The transfer of the Galveston State Psychopathic Hospital to the medical college to provide exceptional facilities for psychiatry was also recommended. Immediate needs proposed by Dr. Leake include: estimated repair costs, \$10,000; pediatric clinical laboratories, \$2,500, which will come from the Buchanan Foundation; pediatric experimental facilities, \$15,000 from the Buchanan fund; housing for women medical students, \$40,000, and locker rooms for hospital help, \$12,000. Dr. Leake also recommends that legislative appropriations be increased to provide appropriate salaries to insure additional teachers necessary to reach a reasonable approach of the optimum teacher-student ratio for American medical schools of one instructor to ten students per course, and that a salary scale be provided that will assure competent teachers and research workers. The salary range in the preclinical departments of the better medical schools of the United States, it was stated, is as follows: for

full time faculty members—professor, \$12,000 to \$16,000; associate professor, \$6,000 to \$10,000; assistant professor, \$4,500 to \$8,000; instructor, \$3,000 to \$6,000; assistant, \$2,000 to \$3,600.

WEST VIRGINIA

Questionnaires to Determine Psychiatric Program.—

Results of questionnaires will be presented to the council of the West Virginia State Medical Association at its meeting this month to determine what part, if any, the association will take to provide a general program on psychiatric education for practicing physicians in the state. Of the 350 physicians whose questionnaires have been reviewed, 90 per cent would like additional knowledge on psychiatry and at least 80 per cent would like to know more about emotional illness. Less than 15 per cent of the physicians replying to the questionnaire sent out by the state society in August stated that they have had any training or developed any working concept in psychiatry. Almost all of the replies indicate a general lack of psychiatric assistance in the state. More than 90 per cent of the physicians are interested in seminars on psychiatry to be held evenings at meetings of component medical societies, and 50 per cent of the group expressed their willingness to pay a nominal attendance fee. Seventy per cent signified their willingness to have a symposium on psychiatry presented in the *West Virginia Medical Journal*. The returned questionnaires indicated that doctors would be willing to have psychiatry presented in simple terminology and related to general medicine, with stress being placed on the handling of psychoneuroses, subclinical personality problems and psychosomatic disturbances.

Medical Societies Merge.—On October 20 the Lewis County Medical Society was merged with the Central West Virginia Medical Society, carrying out a unanimous vote of both groups. The consolidation of the two societies will mean an active roll of more than fifty doctors. The Lewis County Medical Society includes physicians in Gilmer County, and members of the enlarged Central West Virginia Medical Society residing in six adjoining counties can conveniently meet at the county seat in any of these communities. The Lewis-Upshur Medical Society was organized in 1899 principally through the efforts of Dr. Thomas M. Hood, Clarksburg, who recently died in that city at the age of 91 years. That same year the state medical association held its annual convention at Weston and the late Dr. Charles S. Hoffman, Keyser, was elected president. In 1915 the doctors of Upshur County withdrew from the Lewis County Medical Society and became members of the Central West Virginia Medical Society, then composed of doctors residing in Nicholas, Braxton and Webster counties. Three members of the Lewis County Medical Society who were charter members at the time of the organization of the Lewis-Upshur Society are still in practice at Western and are members of the Lewis County Medical Society. These members, Drs. George Snyder, Wessie P. King and Edward T. W. Hall, are now honorary life members of the local society and the state medical association.

GENERAL

Pediatric Society Opposes Children's Bureau Transfer to Public Health Service.—At a meeting of the American

Pediatric Society in Atlantic City, N. J., September 25-27, a resolution was adopted affirming the society's wish to continue the hitherto good relations between it and the Children's Bureau. Other resolutions affirmed that no change in the method of payment in the EMIC program is warranted or desirable and that the transfer of the health services of the Children's Bureau to the U. S. Public Health Service, contained in the Miller bill now before Congress, is undesirable. The resolution points out that this transfer would separate medical care from the other essential aspects of child care and emphasizes that the Miller bill does not make any provision for the development of a National Department of Health. Dr. C. Anderson Aldrich, Rochester, Minn., was chosen president of the American Pediatric Society during this meeting. Dr. Charles Hendee Smith, New York, vice president and Dr. Hugh McCulloch, St. Louis, secretary-treasurer. Dr. Heyworth N. Sanford, Chicago, is the recorder-editor.

The Poliomyelitis Situation.—The 1944 epidemic of infantile paralysis has officially become the second worst in the recorded history of the disease in the United States, the National Foundation for Infantile Paralysis announced October 29. In the first forty-one weeks of 1944, or up until October 14, there were 16,133 cases of poliomyelitis, according

to the latest report from the U. S. Public Health Service. This is 353 cases more than were reported in the country for 1931, which previously had been the second worst year for the disease. The all time record was in 1916, when there were 27,621 cases. Although the peak of the outbreak had been passed a month before this report, the epidemic itself has not yet ended, it was stated. There were 710 new cases reported for the week of October 7-14, or nearly half the weekly total at the peak of the epidemic, the week ended September 2, when 1,683 cases were reported. The seven states most severely menaced were New York, North Carolina, Pennsylvania, New Jersey, Virginia, Ohio and Kentucky, but emergency aid in the form of money, professional personnel and supplies has been sent this year by the National Foundation to twenty-one states and the District of Columbia.

Earl Bonnett Named Medical Director of Metropolitan Life.—Dr. Earl C. Bonnett, associate medical director of the Metropolitan Life Insurance Company, New York, has been appointed medical director of the company, to succeed the late Dr. Charles L. Christiernin, who died October 18. In his new capacity Dr. Bonnett will supervise a staff of about 8,000 physicians who serve as medical examiners for the Metropolitan in the United States and Canada. He will be responsible for the formulation of rules for the medical examination of applicants for insurance and advise in the establishment of rules for the selection of risks. His duties will also involve the management of home office health activities, which include the medical care and periodic physical and dental examinations of some 14,000 employees. Dr. Bonnett graduated at Cornell University Medical College in 1923 and joined the staff of the Metropolitan as a medical examiner in the home office in 1926. He was advanced to official rank as assistant medical director in 1928 and promoted to associate medical director in 1944.

Music in Therapy.—The National Music Council recently conducted a survey to ascertain to what extent music is currently used in leading nervous and mental disease hospitals throughout the country. Two hundred and nine hospitals with various bed capacities answered a questionnaire. Only 192 of the 209 used music. The rest were refrained from adopting this form of therapy by war restrictions and economics, shortage of personnel and lack of facilities. There are performances in 160 hospitals by visiting artists, gifted patients, church choirs, bands and glee clubs. Recorded music is played by 152 institutions. Only 23 hospitals reported that they used music for therapeutic reasons, and 134 used it for both recreation and therapy. According to a report in the *New York Times*, most directors of hospitals find that "recreation is therapy." Active participation in the making of music is generally considered more effective than mere listening. Group performance develops a spirit of cooperation and fellowship and helps patients to overcome their inhibitions. The psychiatric staff of one hospital finds that the blare and dissonance of jazz "is a disturbing influence to all types of patients." Band music, spirituals, American folk songs are soothing. But music is not a specific for mental disorders, it was stated; there is even the danger that the wrong music may be used by patients to express and reinforce delusional ideas.

National Research Council Named for Pharmaceutical Award.—The American Pharmaceutical Manufacturers' Association announces that the National Research Council has been chosen for its sixth annual award "in recognition of its fundamental contributions to public health in the field of medical sciences and of its essential services to the country in World Wars I and II." The award will be presented during the final day's session of the two day meeting of the American Pharmaceutical Manufacturers' Association at the Waldorf-Astoria, New York, December 11-12. Among the speakers in a program devoted to some fundamental trends in chemotherapy will be:

Dr. John S. Lundy, Rochester, Minn., Progress in Conquest of Pain by New Anesthetics.
Dr. Chester S. Keefer, Boston, Progress in Conquest of Bacteria by New Medicinal Agents.
William C. Rose, Ph.D., Urbana, Ill., Progress in Conquest of Malnutrition by Amino Acids.
Edwin J. Cohn, Ph.D., Cambridge, Mass., Progress in Conquest of Disease by Blood Proteins.
Wendell M. Stanley, Sc.D., Princeton, N. J., Progress in Conquest of Disease by Virus Proteins.

Dr. Alan Gregg, New York, director of medical sciences, Rockefeller Foundation, will give the presentation address, on "Essential Need of Fundamental Research in Medical Sciences for Social Progress," and Dr. Ross G. Harrison, New Haven, Conn., chairman of the National Research Council, the acceptance address, entitled "National Research Council and Its Action in Field of Medical Sciences."

LATIN AMERICA

Health Activities in Latin America.—*Personal.*—Lieut. Col. Leon H. Collins Jr., M. C., who practiced in Philadelphia before entering military service in 1942, has been appointed section chief at Gorgas Hospital, Ancon, Canal Zone.

Report of Health and Sanitation Division.—A summary of activities of the health and sanitation division, Office of the Coordinator of Inter-American Affairs, has recently been published. Between February 1942 and July 1943 agreements for cooperative health work were signed with fifteen of the other American republics, according to the Newsletter of the division. Mexico was added in July 1943, the Dominican Republic in August 1943 and Uruguay in November 1943. Twelve republics which arranged to extend the program for periods of two and one-half to five years include Brazil, Colombia, Costa Rica, the Dominican Republic, El Salvador, Honduras, Mexico, Nicaragua, Peru, Paraguay and Venezuela. Renegotiations for Bolivia and Guatemala are pending. The report states that more than six hundred activities are under way or completed in the southern countries including 300 jobs for environmental improvement by permanent mosquito control measures, water supplies, sewerage systems and general sanitation. Construction work includes provision or improvement of facilities for a total of about one hundred and forty health centers, hospitals, infirmaries, dispensaries and other buildings. Over two hundred activities are devoted to provision of medical care and preventive services through operation of hospitals, health centers, clinics and laboratories, surveys and research in disease control, local training courses and widespread health education for the lay public. Although the division was established in February 1942, the report indicates the expansion of its activities during the period July 1, 1943 through June 30, 1944, in which projects reported completed total one hundred and forty-three and include complete construction, additions to or remodeling of sixteen hospitals, seventeen health centers, twelve dispensaries and fifteen other buildings. Health centers were completed at Encarnacion and Concepcion and in the Barrio Obrero District of Asuncion. In the latter a combination 50 bed hospital and health center was constructed, with x-ray and laboratory sections to serve both units. Since September 1943, operation and maintenance of the hospital section has been carried on by the ministry of health, with supervision of all nursing personnel by a United States nurse serving with the field party. Operation of the health center is a cooperative project, with a Paraguayan doctor serving as health officer. Cooperative direction of medical facilities and specific disease control services was terminated by the completion of some thirty projects, many of which were turned over to the national departments of health for continuing operation. These included plague control in Ecuador and treatment services in many areas of Colombia. In other instances the closed projects consisted of prevalence surveys or were of an emergency nature, such as those in El Salvador. Here medical services were provided for the care and improvement of the health of employees on the Pan American Highway from March 10 through September 30, 1943. A medical supervisor had headquarters at Santa Rosa. Malaria surveys were made by means of routine blood smears and cases treated with quinine and atabrine. Inspections were also made periodically to diagnose and treat venereal disease. The project was in cooperation with the department of public works of the republic of El Salvador and the U. S. Army engineers in charge of the Pan American Highway. Under the professional training program arrangements were made for 212 persons from the other Americas for study or travel grants in the United States. These consisted for the most part of physicians or engineers who were enrolled in schools of public health for courses leading to certificates or degrees in this field.

CORRECTIONS

Globin Insulin.—The second article of the July issue of the *Annals of the District of Columbia* listed in *THE JOURNAL*, October 7, should read "Comparative Study of Action of Globin Insulin with Other Forms of Insulin. M. Protas." The word Globulin is a misprint in *THE JOURNAL*.

Modified Miller-Abbott Tube.—At the request of Dr. Franklin I. Harris, who wrote "A New Rapid Method of Intubation with the Miller-Abbott Tube" (*THE JOURNAL*, July 15) credit should be given to Dr. Ivar Sivertsen for independent use of metallic mercury in the balloon of the Miller-Abbott tube. This modification of the Miller-Abbott tube was mentioned in a paragraph in the book by Wangenstein entitled "Intestinal Obstruction," second edition, page 164.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 11, 1944.

Workmen's Compensation to Be Taken Over by the Government

The expansion of medical socialism, in the form of compulsory social insurance, has been described in a previous letter. In a further paper the government has outlined proposals for a new industrial injury insurance scheme to replace the present system of workmen's compensation. The legal liability of the employer to compensate an employee for loss of earning capacity due to accident or industrial disease arising out of his employment is swept away, and provision for disablement or loss of life from industrial injury or specified industrial diseases becomes a social service. This fundamental change is based on the recommendations of the Beveridge scheme, but the benefits are substantially more generous. Instead of being related to loss of earning capacity, as under the existing compensation law, the benefits will be paid on flat rates, with supplements for family responsibilities. A financial responsibility which rests on the employer will now be shared by him, the employee and the state. Contributions will be 12 cents a week for adult men and 8 cents for adult women, and half these rates for boys and girls under 18. Employers will pay the same amounts. The scheme will apply to the 18,000,000 employed persons in the social insurance scheme.

A workman incapacitated by an industrial injury will receive \$7 a week up to thirteen weeks, with \$1.75 added for a wife and \$1 for the first child. Allowances for other children will also be payable under the family allowances scheme. If the disablement is likely to be permanent or prolonged, the allowance will be replaced by an industrial pension based on a medical assessment of the degree of disability. The pension rate for total disability will be \$8 a week, with allowances of \$2 a week for a wife and \$1.50 for the first child. Benefits are also payable to a widow or to other dependents on the death of an insured person. Before the war, workmen's compensation cost employers \$40,000,000 a year, which was increased to \$68,000,000 by wartime legislation. Under the new scheme benefits are estimated to cost \$80,000,000 annually, with a further \$12,000,000 required for administration. One sixth of the cost will be borne by the state, and the rest in equal shares by employers and employees. Thus the cost to either of the latter will be something less than \$40,000,000 a year. A great merit claimed for the new scheme is that it will remove workmen's compensation from the atmosphere of conflict with which it has been surrounded and avoid the ultimate recourse to litigation between employer and workman.

Sir Humphry Davy Rolleston

The death at the age of 82 of Sir Humphry Davy Rolleston, September 24, removes a prominent figure in British medicine. He came of a family distinguished in science, his father being George Rolleston, M.D., F.R.S., Linacre professor of physiology at Oxford, and his mother a niece of the physicist Sir Humphry Davy. He was educated at Cambridge, where he had a distinguished career, and at St. Bartholomew's Hospital. After serving as house physician and demonstrator of anatomy he wrote "A Manual of Practical Morbid Anatomy." He was appointed assistant physician to St. George's Hospital, where he taught pathology. He became associated with Sir Clifford Allbutt, regius professor of medicine at Cambridge, and assisted him in the preparation of his "System of Medicine" in eight volumes, which appeared from 1896 to 1899 and for many years was a leading textbook of medicine. In the revised edition,

which appeared from 1906 to 1911, his name appeared as co-author. He wrote several of the articles, notably those on alcoholism, diseases of the esophagus, small intestine, adrenal glands, spleen and lymphatics. In 1925, on the death of Allbutt, he succeeded to the professorship. He was examiner in medicine in most of the universities and in 1922 was president of the Royal College of Physicians.

What distinguished him most was prodigious learning and utmost accuracy as a writer and editor. In his Harveian Oration on Cardiovascular Diseases he quoted some three hundred authors. The first important work to appear under his name was "Diseases of the Liver, Gallbladder and Bile Ducts," published in Philadelphia in 1905. A third edition, in which Prof. J. W. McNee cooperated, appeared in 1929. Among shorter works from his pen were "The Medical Aspects of Old Age," an essay on "Writing Theses for the M.B. and M.D.," which was a useful medicoliterary help, and the Osler memorial oration. He was the author of innumerable addresses and articles. In 1936 he began the editorship in twelve volumes of the British Encyclopedia of Medical Practice, writing many of the sections himself. From 1928 almost until the time of his death he was editor of the *Practitioner*. He took part in much administrative work, sitting on numerous government committees—the Medical Consultative Board for the Navy, the Medical Administrative Committee of the Royal Air Force, the Royal Commission on National Health Insurance, the Royal Commission on Lunacy and Mental Disorder and the Colonial Committee on Medical Services. In his full life he was much respected for his integrity, perfect courtesy and devotion to truth.

The Medical Staff at Arnhem

Of the 6,500 air borne troops landed at Arnhem, only 2,000 returned unwounded after nine days' almost sleepless fighting. Some 1,200 wounded had to be left behind, but a wounded officer who afterward escaped said that the Germans were treating them with consideration. The divisional medical staff of all ranks chose to stand by their patients and went with them into captivity. A staff officer stated that the action of this fine division contributed much to the success of the operation, which should be looked on not as a brilliant failure but as an expensive success.

Marriages

DOROTHY E. DONLEY, Columbus, Ohio, to Mr. Thomas P. Dowd of Somerset, Md., in Washington, D. C., September 4.

GEORGE HENRY BUNCH JR., Columbia, S. C., to Mrs. Nancy Riddleberger Hutchinson in Washington, D. C., October 1.

JOSEPH F. CORSARO, Cleveland Heights, Ohio, to Miss Dorothy Elizabeth Yopko of Munhall, Pa., September 23.

RICHARD HENRY STANTON, Newton, Mass., to Miss Elizabeth Cecelia Eichorn of West Medford, September 4.

JAMES NATHAN SLUDGE JR., Greensboro, Ala., to Miss Evelyn Camille Wohlers of Yakima, Wash., September 2.

MARVIN S. ALTER, Salt Lake City, to Miss Ellen Scott of San Gabriel, Calif., in Los Angeles recently.

WALTER RANDOLPH CHITWOOD, Wytheville, Va., to Miss Ruth Anne Reed of Willis, September 18.

THOMAS D. DUANE, Peoria, Ill., to Dr. JULIA A. McELHINEY of Iowa City, Iowa, March 22.

THOMAS B. DANIEL, Oxford, N. C., to Miss Bette Margolis of Worcester, Mass., September 13.

HUGH HYDEN GREGORY, Dalton, Ga., to Miss Myrtle Louvenia Durham of Atlanta, September 21.

JAMES J. BARROCK, Milwaukee, to Miss Marie Theresa Ramy of Mankato, Minn., September 4.

LEONARD M. VAN STONE to Mrs. Emelie Culbertson Kistler, both of Denver, August 8.

SAUL ROY KOREY to Miss Doris Evelyn Broder, both of New York, October 15.

Deaths

Milbank Johnson, Pasadena, Calif.; Northwestern University Medical School, Chicago, 1893; member of the California Medical Association and the Southern California Medical Association; chairman of the special medical research committee at the University of Southern California, Los Angeles; professor of physiology and clinical medicine from 1897 to 1901; for twelve years, from 1901 to 1913, chief surgeon for the Southern California Edison Company; president of the Municipal Charities Commission, Los Angeles, from 1913 to 1917; vice president and director of the Pacific Mutual Life Insurance Company from 1917 to 1936; director of the American Insurance Federation since 1917; president of the Western States Taxpayers Conference and the California Taxation Improvement Association, 1925-1926; since 1926 chairman of the board of directors of the California Taxpayers Association; director and member of the executive committee of the National Tax Association; member of the board of directors of the Pasadena Hospital Association; served as a member of the board of health of Los Angeles from 1900 to 1904 and as a member of the board of freeholders which revised the Los Angeles city charter in 1916; member of the executive committee of the California Military Welfare Commission during World War I; member and past president of the California Conference of Social Agencies; vice chairman of the California Educational Aid Foundation; president of the Southwest Museum from 1920 to 1926; received the LL.D. from the University of Southern California in 1917 and Northwestern University in 1920; since 1942 member of the city defense council and the Red Cross Emergency; died in the Huntington Memorial Hospital October 3, aged 72.

Sidney Morrill McCurdy * St. Johnsbury East, Vt.; Western Reserve University Medical Department, Cleveland, 1904; resigned in 1941 as chief medical director of the Ohio State Industrial Commission, a position he had held since 1936; during World War I served as a captain in the medical corps, 18th Infantry, first division, and had been awarded the Croix de Guerre, the Bronze Star and the Presidential citation for bravery; recommended for the Distinguished Service Medal; member of a committee on industrial sanitation formed in 1915 by the Section on Preventive Medicine and Public Health of the American Medical Association; lecturer on industrial medicine at the Ohio State University College of Medicine, Columbus for many years; past president of the Mahoning County (Ohio) Medical Society; formerly chief surgeon of the Youngstown Sheet and Tube Company in Youngstown, Ohio, and medical director of the Plumbrook Ordnance Works in Huron, Ohio; served as a member of the staffs of the Youngstown Hospital, Youngstown, Ohio, and the Brightbrook Hospital, St. Johnsbury; died September 26, aged 63.

Ralph Garfield Mills * Decatur, Ill.; Northwestern University Medical School, Chicago, 1907; an Associate Fellow of the American Medical Association; aided in building the Kennedy Hospital, Kangkai, Korea, of which he was head from 1908 to 1912; professor of pathology and bacteriology and in charge of the clinical laboratories and research department, Severance Union Medical College, Seoul, Korea, from 1913 to 1918; served as head of the department of pathology at Johns Hopkins University, Baltimore; formerly professor and head of the department of pathology at the University of Colorado School of Medicine, Denver; entered the Mayo Clinic, Rochester, Minn., as an associate in pathologic anatomy and later became professor of pathology at the University of Minnesota, Graduate School; formerly on the staff of St. Agnes Hospital, Fond du Lac, Wis.; member of the American Association of Pathologists and Bacteriologists and the Wisconsin Academy of Science; died in St. Mary's Hospital October 17, aged 63.

Laird Sumner Van Dyck * New York; Rush Medical College, Chicago, 1924; associate in dermatology and syphilology at the New York Post-Graduate Medical School, Columbia University; specialist certified by the American Board of Dermatology and Syphilology; member of the American Academy of Dermatology and Syphilology; diplomate of the National Board of Medical Examiners; served on the staffs of the Welfare Hospital for Chronic Diseases and the New York Skin and Cancer Hospital; chief of clinic, attending dermatologist and syphilologist to the dispensary, and assistant attending dermatologist and syphilologist, New York Post-Graduate Hospital, where he died August 9, aged 51, of generalized lymphosarcoma.

Edward Charles Podvin * New York; Albany Medical College, Albany, N. Y., 1898; member of the House of Delegates of the American Medical Association in 1941, 1942 and 1943; assistant secretary of the Medical Society of the State of New York; executive secretary and past president of the Bronx County Medical Society; past president of the Catholic Physicians' Guild; chairman of the Bronx Tuberculosis and Health Committee; on the consulting staffs of the Fordham and St. Francis hospitals; in 1935 appointed by Governor Lehman a member of the state industrial council; editor of the *Bulletin of the Bronx County Medical Society*; died September 27, aged 68, of arteriosclerosis.

James Moorhead Murdoch * Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1892; member of the American Psychiatric Association, the Central Neuropsychiatric Association and the Association for Research in Nervous and Mental Disease; president of the American Association on Mental Deficiency in 1903 and secretary from 1917 to 1921; formerly instructor in histology and pathology at his alma mater; for many years physician and superintendent of the State Institution for the Feeble-minded of Western Pennsylvania, Polk; superintendent of the Minnesota School for Feeble-minded at Faribault from 1927 to 1937, when he resigned; died October 9, aged 75.

Saul Berman * Boston; Harvard Medical School, Boston, 1920; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; formerly assistant in obstetrics at his alma mater; served an internship at the Boston City Hospital; formerly a resident physician at the Boston Lying-in Hospital; on the staffs of the Newton Hospital, Newton, Massachusetts Women's Hospital, New England Hospital for Women and Children and the Boston Lying-in Hospital; founder of the fertility clinic and laboratory at the Beth Israel Hospital; died in the New England Deaconess Hospital September 18, aged 48, of carcinoma of the testis and uremia.

Harlan Herbert Staats * Charleston, W. Va.; Barnes Medical College, St. Louis, 1899; an Affiliate Fellow of the American Medical Association; honorary member of the Kanawha County Medical Society and the West Virginia State Medical Association; during World War I served in the medical corps of the U. S. Army as a plastic surgeon with evacuation hospital number 41 and had been honorably discharged with the rank of captain; founder and president of the Staats Hospital; formerly surgeon in charge of the Roane County Hospital, Spencer; died in a Huntington hospital September 30, aged 68, of myocardial failure.

Wilbur Stuart Wood, Decatur, Ill.; University of Illinois College of Medicine, Chicago, 1925; member of the American Academy of Orthopaedic Surgeons and the Illinois State Medical Society; specialist certified by the American Board of Orthopaedic Surgery, Inc.; served with the 149th Field Artillery in France during World War I; formerly an intern at St. Luke's Hospital in Chicago; past president of the Macon County Tuberculosis and Visiting Nurses' Association; on the staffs of the Decatur and Macon County and St. Mary's hospitals; died in Minoqua, Wis., August 7, aged 44, of coronary thrombosis.

Henry Carter Metcalf * Connersville, Ind.; University of Louisville Medical Department, Louisville, Ky., 1913; served as a member and at the time of his death president of the Indiana State Board of Health; served as secretary of the Fayette County Board of Health, county coroner and president of the Fayette-Franklin Counties Medical Society; served overseas as a first lieutenant with the 163d Depot Brigade, 132d Engineers during World War I; member of the Connersville Board of Health; director of the Central State Bank; died in the Fayette Memorial Hospital, September 23, aged 56, of hypertensive vascular disease.

William Edwin Joiner, Seattle; Bellevue Hospital Medical College, New York, 1898; member of the Washington State Medical Association and the Pacific Coast Oto-Ophthalmological Society; served during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; for many years affiliated with the Veterans Administration; at one time served as assistant eye surgeon at the Brooklyn Eye and Ear Hospital, Brooklyn; died in the Veterans Administration Facility, Portland, Ore., August 7, aged 74, of bronchogenic carcinoma.

John Robert Abercrombie * Baltimore; University of Maryland School of Medicine, Baltimore, 1895; formerly associate professor of dermatology at his alma mater; served as professor of materia medica and dermatology at the Woman's Medical College of Baltimore; died August 3, aged 75.

George Sheldon Adams * Yankton, S. D.; Rush Medical College, Chicago, 1901; member of the American Psychiatric Association; medical superintendent of the Yankton State Hospital; on the staff of the Sacred Heart Hospital, where he died July 28, aged 67, of chronic endocarditis and acute dilatation of the heart.

James Edwin Arwine, Santa Rosa, Calif.; University of the South Medical Department, Sewanee, Tenn., 1894; member of the American Psychiatric Association; served during World War I; served on the staffs of various Veterans Administration facilities, including the one at Palo Alto, where he died August 24, aged 71, of arteriosclerotic heart disease.

Albra W. Baker, Elizabethtown, Pa.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1887; died in the Masonic Home August 16, aged 85, of cerebral hemorrhage and arteriosclerosis.

William A. D. Barnhill, Laotto, Ind.; Cleveland Medical College, Homeopathic, 1893; died in the Methodist Hospital, Fort Wayne, September 25, aged 84, of pneumonia following a fracture of the left femur received in a fall.

Stephen Vincent Bedford, Jefferson City, Mo.; University of Missouri School of Medicine, Columbia, 1903; member of the Missouri State Medical Association; served as presi-

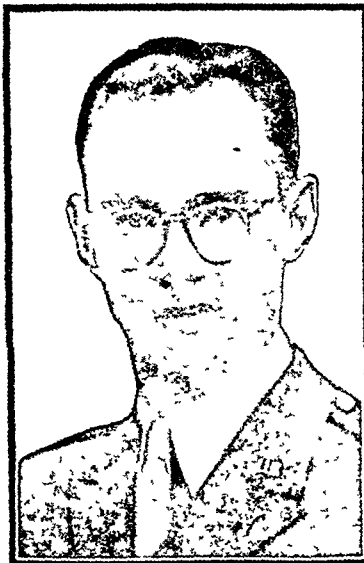
William King Campbell * Long Branch, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1900; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; past president of the Monmouth County Medical Society; chief of the eye, ear, nose and throat department, Monmouth Memorial Hospital; vice president of the Long Branch Building and Loan Association; died September 21, aged 65, of coronary thrombosis.

Charles Leonard Christiernin * Maplewood, N. J.; Harvard Medical School, Boston, 1906; member of the Massachusetts Medical Society; in 1916 became assistant medical director and in 1935 medical director of the Metropolitan Life Insurance Company, New York; a member of the executive committee of the Association of Life Insurance Medical Directors, of which he had been treasurer, vice president and president; died suddenly October 18, aged 66, while on a vacation in Coreys, N. Y., of coronary thrombosis.

Francis Xavier Crawford, Boston; Harvard Medical School, Boston, 1898; member of the Massachusetts Medical Society, on the staffs of St. Elizabeth's and Carney hospitals; medical director for the United Fruit Company; died August 19, aged 71, of cerebral hemorrhage.



LIEUT. WILLIAM C. CRAIG, M. C.,
A. U. S., 1910-1944



LIEUT. TENNYSON G. JOHNSON
M. C., A. U. S., 1915-1944



MAJOR BERTRAM W. MORSE
M. C., A. U. S., 1901-1944

dent of the Cole County Medical Society; on the staff of St. Mary's Hospital; chief surgeon for the Missouri Pacific Railroad; died August 23, aged 63, of myocarditis and multiple neuritis.

Edison William Brown, Revere, Mass.; Tufts College Medical School, Boston, 1905; member of the Massachusetts Medical Society; on the staffs of the Winthrop Community Hospital, Winthrop, Whidden Memorial Hospital, Everett, and the Chelsea Memorial Hospital, Chelsea, where he died August 18, aged 67, of coronary thrombosis.

Emilio Deantonio * Scranton, Pa.; Regia Università degli Studi di Pavia Facoltà di Medicina e Chirurgia, Italy, 1894; in June 1944, presented with a testimonial plaque by the Medical Society of the State of Pennsylvania in recognition of fifty years of practice; formerly associated with the Scranton Private Hospital; died August 28, aged 72.

Bernard Walker Donohue, Baltimore; University of Maryland School of Medicine, College of Physicians and Surgeons, Baltimore, 1931; served an internship at the University of Maryland Hospital and the Bon Secours Hospital; served a

KILLED IN ACTION

William C. Craig, Waynesboro, Pa.; Ohio State University College of Medicine, Columbus, 1935; member of the Medical Society of the State of Pennsylvania, served an internship at the Allegheny General Hospital, Pittsburgh; commissioned a first lieutenant in the medical corps, Army of the United States, Sept. 4, 1942 and began active duty Oct. 15, 1942; a flight surgeon in the air corps; killed in action in the South Pacific area April 28, aged 33.

Tennyson Gates Johnson, Kerkhoven, Minn.; University of Minnesota Medical School, Minneapolis, 1943; served an internship at the City of Detroit Receiving Hospital, Detroit; commissioned a first lieutenant in the medical

corps, Army of the United States, on Aug. 6, 1942, began active duty on July 3, 1943, killed in action in the European area July 13, aged 28.

Bertram Wallace Morse, Whitehall, Mich.; Detroit College of Medicine and Surgery, 1932; member of the Michigan State Medical Society; served an internship at the Henry Ford Hospital in Detroit; served as health officer and as vice president of the chamber of commerce; commissioned a captain in the medical corps, Army of the United States, on May 21, 1942; began active duty on June 22, 1942, later promoted to major, killed in action in the European area August 29, aged 43.

residency at the University Hospital, died August 19, aged 38, of bronchogenic carcinoma with metastasis

Lovic Culver Ellis, Florence, Ala., University of Tennessee College of Medicine, Memphis, 1914, member of the Medical Association of the State of Alabama, died September 22, aged 53, of coronary thrombosis

Charles Henry Herrick, Unadilla, N Y.; Albany Medical College, Albany, N Y., 1893, member of the Medical Society of the State of New York, health officer of the village and town of Unadilla, formerly health officer of Gilbertsville, on the staff of the Sidney Hospital, Sidney, died in the Aurelia Osborn Fox Memorial Hospital, Onconta, August 30, aged 80, of arteriosclerotic heart disease

George Inglis, Oswego, Ore., Rush Medical College, Chicago 1884, died August 28, aged 88, of arteriosclerosis and myocarditis

Roy Howard Johnson, Los Angeles; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1904, member of the California Medical Association; anesthetist at the Orthopaedic Hospital, member of the staff of the California Hospital, where he died July 24, aged 66, following a gastrectomy and virus pneumonia

Charles Warton Kidder, Woodstock, Vt., University of Vermont College of Medicine, Burlington 1907, served during World War I, died in the Veterans Administration Facility, White River Junction, August 6, aged 59, of cerebral hemorrhage

Franklin Jacob Lins, Durand, Ill., Rush Medical College, Chicago 1897, died in St. Anthony's Hospital, Rockford August 1, aged 80, of coronary sclerosis

Eugene Alphonsus McCabe, Sioux City, Iowa, John A. Creighton Medical College, Omaha, 1920, died August 21, aged 47, of coronary heart disease

William Adam Mess @ Washington, D C., George Washington University School of Medicine, Washington 1907, also a pharmacist, medical examiner for Selective Service Board number 14, on the staffs of the Sibley, Doctors, Homoeopathic, Providence, Garfield, Georgetown, George Washington and Emergency hospitals, killed in an automobile accident on the Mount Vernon Highway, Alexandria, Va., August 11, aged 62

Elmer Ewell Owen, Batavia, N Y., University of Michigan Homoeopathic Medical School, Ann Arbor 1907, member of the Medical Society of the State of New York, served in France during World War I, died August 2, aged 62, of actinomycosis

Peter Marius Pedersen @ Dannebrog, Neb., University of Nebraska College of Medicine, Omaha 1904, died August 2, aged 73, of heart disease

John Henry Reichling @ Bennington, Vt., University of Vermont College of Medicine, Burlington 1906, on the staff of the Henry W. Putnam Memorial Hospital, died in St. Donat, Canada, September 18, aged 65, of cardiac syncope

Charles William Smith, Allquippa, Pa., Western Pennsylvania Medical College, Pittsburgh, 1906, member of the Medical Society of the State of Pennsylvania, examining physician for draftees during World Wars I and II, served as president of the local board of health, died August 2, aged 66, of carcinoma of the left kidney

Arthur Gilman Tullar @ North Hollywood, Calif., Northwestern University Medical School, Chicago, 1906, died October 11, aged 67, of coronary thrombosis

John David Vedder, Johnstown, N Y., Albany Medical College, Albany, N Y., 1896, member of the Medical Society of the State of New York, served as secretary, president and treasurer of the Fulton County Medical Society, formerly city health officer, city physician and member of the board of health, on the courtesy staff of the Nathan Littauer Hospital, Gloversville, died August 7, aged 81, of pyonephrosis

George Fritz Way @ Urbana, Ill., University of Illinois College of Medicine, Chicago, 1911, died in the Wesley Memorial Hospital, Chicago, August 14, aged 59, of carcinoma of the rectosigmoid

Carl Frederick Weinberger, Chicago, Rush Medical College, Chicago, 1907, member of the Illinois State Medical Society, at one time principal of Muskegon High School, Muskegon, Mich., on the consulting staff, Evangelical Hospital of Chicago, where he died August 14, aged 71, of cerebral hemorrhage

Jacob Andrew Youngman @ St. Louis, St. Louis College of Physicians and Surgeons, 1905, on the staff of St. Anthony's Hospital, died at his home in Sappington, Mo. August 10, aged 66, of coronary sclerosis and chronic myocarditis

DIED WHILE IN MILITARY SERVICE

John Weyman Davis, Athens, Ga., Emory University School of Medicine, Atlanta, 1927, member of the Medical Association of Georgia and the Southeastern Surgical Congress, fellow of the American College of Surgeons, on the surgical staffs of the Athens General and St. Mary's hospitals, commissioned a lieutenant commander in the medical corps of the U S Naval Reserve on Oct. 12, 1939, began active duty on May 19, 1941, promoted to commander on Aug. 1, 1942, died in the Naval Hospital, Charleston S C., September 18, aged 42, of Rocky Mountain spotted fever.

Frank John Fischer @ Chagrin Falls, Ohio, University of Wisconsin Medical School, Madison 1934, formerly an intern and resident in surgery at the City Hospital and a resident in surgery at St. John's Hospital, both of Cleveland, fellow of the American College of Surgeons, served on the surgical staff of St. Luke's Hospital in Cleveland, certified as a commercial pilot by the Civilian Aeronautics Commission on July 1, 1942, commissioned a captain in the medical corps, Army of the United States, on Sept. 8, 1942, certified as an aviation medical examiner, stationed at the hospital, Camp Springs Army Air Field, Washington, D C., died September 21, aged 35, as the result of a plane crash following a forced landing 20 miles west of Leesburg, Va.

John Edward Fissel Jr., Newport News, Va., University of Maryland School of Medicine, College of Physicians and Surgeons, Baltimore, 1936, formerly secretary and treasurer of the Warwick County Medical Society, served an internship at the Church Home and Infirmary in Baltimore and a residency in surgery at the Riverside Hospital, commissioned a first lieutenant in the medical reserve corps of the U S Army on Sept. 7, 1942, later promoted to captain, killed in Prestewick, Scotland, August 22, aged 32, in an airplane accident

Frederick Hugh Greenwell, Lieutenant (jg) M C U S Navy, New Haven, Ky., University of Louisville (Ky.) School of Medicine, 1943, intern at the Naval Hospital, Jacksonville, Fla., where he died August 10, aged 27, of primary atypical pneumonia

George Bernhard Miller @ San Francisco, Stanford University School of Medicine, San Francisco, 1937, served an internship and residency at the Lane and Stanford University Hospitals and a residency in tuberculosis at the San Francisco Hospital, commissioned a first lieutenant in the medical corps, Army of the United States on Nov. 11, 1942, died in Grass Valley, July 15, aged 34, of myocardial infarction due to coronary disease

Woodman Bradbury Pomeroy @ Lieutenant, M C, U S Navy, Pittsburgh; Harvard Medical School, Boston 1941, served an internship at the Pittsburgh Medical Center, commissioned a lieutenant (jg) in the medical corps U S Navy, on July 14, 1942, promoted to lieutenant on May 1, 1943, flight surgeon, died in the Pacific area July 12, aged 28, of extensive multiple injuries

Stephen William Smith Jr., Hamden, Conn., Tufts College Medical School, Boston 1940, served an internship at the Memorial Hospital in Worcester, Mass., diplomate of the National Board of Medical Examiners, commissioned a lieutenant (jg), medical corps U S Naval Reserve on Nov. 4, 1941, later assigned to the destroyer U S S *Ingraham*, promoted to lieutenant on June 15, 1942, aged 28, presumptive date of death at sea in the Atlantic area Aug. 23, 1943, according to the Navy Department

Jerome Daniel Solomon, Chicago, University of Illinois College of Medicine, Chicago, 1941, served an internship at the Cook County Hospital, commissioned a first lieutenant in the medical reserve corps of the U S Army on June 6, 1941, began active duty on Sept. 21, 1942, later promoted to captain, died in the Southwest Pacific area September 16, aged 28, of tsutsugamushi fever and malaria

John Wesley Speake Jr., Spartanburg, S C., Medical College of the State of South Carolina, Charleston, 1936, served an internship at the Spartanburg General Hospital, commissioned a first lieutenant in the medical corps, Army of the United States, on Aug. 12, 1942, later promoted to captain, a flight surgeon, killed in the European area July 28 in an airplane accident, aged 34

Bureau of Investigation

ADVENTURES OF A DODGER

"Oh Boy!" Perry's Scheme Declared a Mail-Order Fraud

Many of those who dispense health hokum to a credulous public might prosper indefinitely in their enterprises, did not a skeptical Post Office Department look into their schemes and scotch them with fraud orders. Such was the case of Victor Edison Perry of Philadelphia, who carried the letters ND after his name, indicating that he is either a naturopath or a naprapath.

In January 1943 the Post Office Department cited Perry to appear at a hearing and show cause why his business should not be debarred from the mails on the charge that it was a scheme to obtain money through the sale of "GEN SEN" under fraudulent representations that it was an effective treatment for arthritis, diabetes, asthma, liver, kidney, bladder and stomach disorders, and some other ailments. Perry then signed an affidavit that his business had been absolutely discontinued and would not be resumed at any time under any name. This affidavit, he admitted, was filed for the purpose of obviating future fraud order proceedings. In it he agreed to acquiesce to such fraud order if he should be found to have violated his promise. And violate it he did. He continued his business, substituting the names "Vita" and "Nu Vita" for the old one, "GEN SEN," adopting the new trade styles "Vita Herbs Company," "Nu-Vita Herbs Company" and "V E Perry" and using New York and Philadelphia addresses. Soon afterward he executed another affidavit for the Post Office Department in which he admitted that he had resumed the sale of his nostrum under the aforesaid new names thus violating the earlier affidavit. In this second one he again declared that his enterprise had been absolutely discontinued and would not be resumed. In November 1943 however, the Post Office Department cited him again to show cause why a fraud order should not be issued against him. The outcome of the hearing will be mentioned later.

Perry's penchant for alliteration in calling certain of his later nostrums 'Perry's Peptone Pep Pills,' "Peptone Perry's Pink Pep Pills" and "Perry's Famous Peptone (Spanish Fly) Pep Pink Pills" recalls another medicaster's "Pink Pills for Pale People." As the names indicated the various "Pep Pills" were promoted for sexual weakness. Another Perry nostrum "Natura," was represented as a cure for rheumatism, catarrh, low or high blood pressure, swollen tonsils and many other disorders. Perry advertised all his nostrums in their time through periodicals of local and national circulation. What he formerly sold as GEN SEN was played up as "God's gift to India and India's gift to you" and also as "India's Famous Herb Tea." It consisted of three units which were contained, respectively, in red, white and blue packages carrying the American flag (an apparent violation of law), and prospective customers received return envelopes addressed to Perry, on which he spelled his first name "Victory." Some of his advertising literature carried a large red heart on which was printed in white "Is your wife still your sweetheart? Try GEN SEN."

The advertising of Natura instead of representing the product as being from India, described it as a 'Mexico herb tea,' and this literature, too, was done in red white and blue. If one could believe the claims, it was the 'World's Greatest Spring Tonic' and would help "hubby and yourself over 30 feel like 'Sweet Sixteen.' Oh Boy!" Besides it was touted as a reducer under the slogan "It's so easy to be streamline, with Natura."

This "streamliner" according to a government chemist who testified at the Post Office hearing contained sulfur, epsom salt sodium bicarbonate senna cascara and licorice and was identical with GEN SEN. Perry's Peptone Pep Pills, the witness said were essentially a mixture of gentian phosphorus strychnine columbin iodine, cantharides and U S P thyroid. None of the ingredients named for the two preparations constituted anything original or unfamiliar, as was pointed out by another government witness, a Senior Medical Officer of the Food and Drug Administration, nor would such mixtures have any par-

ticularly beneficial effect on the ailments for which these were advertised. He showed that they would not purify the blood or restore the user to a 'new life of youth and pep,' nor would Natura be of any value whatever in treating obesity. As for impotence he testified, the only proper treatment for this would have to be based on a careful diagnosis to ascertain the type and cause of the condition, which in some cases might be psychic.

At this hearing Perry offered no medical witness but, when given opportunity to present his case, devoted practically all his time to asserting that the use of his preparations had given him the vigorous health that was his despite his seventy-seven years. The charges against him were sustained by the evidence presented, and on May 12 1941 a fraud order was issued, covering the names Victor Edison Perry Victory Edison Perry and the numerous variations that he used.

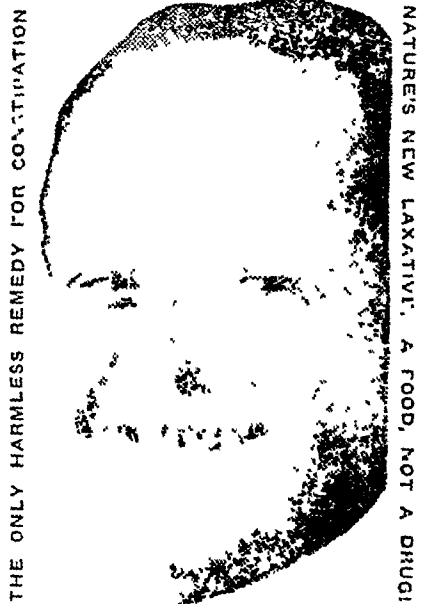
Reproduced on this page is the cartoon front of another Perry nostrum apparently a supplementary laxative 'Natura (Ovato Seeds)' On another side of the cartoon is the claim 'Ovato Seeds from Mother Earth—Contains the 16 Elements of Health,' and the further boast "Prominent M.D.'s all over also Metropolitan Life Insurance Co N Y Life Extension Institute and U S Government recommend it very highly." The package also bears the name of the National Health University (whatever that may be) designating Perry as its president and giving addresses in New York, Boston and Worcester, Mass. besides mentioning 'Operating 23 Founts of Youth Pep Beauty Health Success in U S A.' Possibly one of the "Founts" was "Dr. Perry's Famous Water Crystal and Mineral Salt Hotel and Baths," which, a report said, he was once operating in Beaumont, Texas. The same report stated that his National Health University had its main 'laboratory' at Burbank, Calif., and that Perry gave 'lectures' to promote the sale of many types of alleged health foods.

Apparently the activities of Victor Edison Perry, national dispenser of health can best be summarized by a term in his own advertising—"Oh Boy!" But he is now seventy-seven years old and if Post Office fraud orders won't stop him, the biologic life cycle probably will.

OPEN THIS END
DON'T SPILL — IT'S PRECIOUS!

A FOOD FROM HEAVEN FOR SUFFERING HUMANITY

GOOD BYE, DOCTORS! — USE
NATURA — (Ovato Seeds)



Victor Edison Perry
PRESIDENT

NATIONAL HEALTH UNIVERSITY
Main Office 1560 Broadway, N Y C

GOD'S Great GIFT to NATURE
Nature's great Gift to Humanity

Not Genuine
Without My Photo
and Signature

PRICE, \$1.00

Cartoon front of Natura (Ovato Seeds) "

Correspondence

MALIGNANT GROWTH AFTER SINGLE TRAUMA

To the Editor:—As a contribution toward the solution of the problem raised by correspondents in *THE JOURNAL*, September 9 and 16, concerning the possibility of a malignant growth resulting from a single trauma, I submit the following case report. Please note that it is based on the sworn testimony of physicians and others having personal knowledge of the facts of the case reported:

In April 1935, about 11 p. m., in Salina, Kan., Parker, in the course of his employment, was carrying a box of books. He stumbled, the box struck and damaged the top of a desk, and Parker's chest struck the box. Before quitting work, about 1 a. m., Parker left a note for his supervisor reporting the incident. Whether he reported at that time that he had been hurt is not clear, but when he reached home shortly after 1 o'clock he told his wife of the accident and that his chest had struck the box and was hurting. There was no evidence that he had up to that time suffered from any chest pain. His wife did not examine his chest until three or four weeks later. Then she found "a red spot" about the size of a dollar. On May 15 Parker consulted a physician. About the same time—possibly a month or six weeks or possibly two months after the accident—he told his supervisor that he had hurt his chest when he fell with the box of books and that "a bump" on his chest was caused by a bump or a bruise. Two weeks later, admittedly six weeks to two months after the accident, he showed his supervisor "the swelling" and told him that he got it when he dropped the box about two months previously. Parker continued at work for about fourteen months, although under the care of a physician, Dr. Jenney. By June 16, 1936 the tumor had grown to a lump "the size of a baby's head." It was then removed by an operation. Thereafter Parker was confined to his bed until his death, Sept. 16, 1936.

In proceedings by Parker's widow under the workmen's compensation act, four physicians testified. Dr. Jenney, who had treated Parker from about three weeks after his injury until the time of his death, testified that when Parker first came to his office he had "a hard protuberance, tumor-like" and that he, Jenney, believed that the fall and hurt of which Parker told him was the cause of the injury that eventually developed into the sarcoma of the breastbone. Dr. Fitzpatrick, who had taken x-ray pictures of Parker's chest in March 1936, testified that they revealed a growth on the chest and bone, destruction of the sternum and cartilage of the ribs in the front of the chest; he gave it as his professional opinion that Parker's condition could have possibly come from the alleged injury to his chest in 1935. Dr. Mowery, who removed the growth, gave it as his professional opinion that the tumor resulted from the injury. Dr. Seit, an expert called not by the claimant but by the respondent, testified that sarcoma malignancies are not traceable to trauma in more than two percent of the cases, or even less, but he added:

The important thing is the establishment of the fact of a trauma, and finding within this tissue or that immediately adjacent to the . . . periosteum and the structure of the bone or immediately adjacent to the point of the alleged injury, evidence of the injury. If in such a tissue anywhere from four weeks to a year, or even more, a malignancy develops, I believe it would be considered due to the trauma.

The foregoing clinical history is summarized from a decision of the Supreme Court of Kansas, Dec. 11, 1937, in *Parker, appellee, v. The Farmers Union Mutual Insurance Company and The Maryland Casualty Company*, 146 Kan. 832 (73 P. 2d, 1032). In summarizing the evidence, the court said:

... shall this court say that Parker's prompt report to Cameron, his superior, about his tripping and falling with the box of books, his later statement to Cameron that he hurt his chest in the same fall, the rapid growth of the malignant tumor on his breastbone and the professional opinions of the doctors that such a malignant growth was probably due to the injury as narrated by Parker—all these evidential matters, including the pertinent circumstances, were not sufficient to establish the fact of the accident and the injury? How could the evidence be stronger?

Was not the injury described the exciting cause of the sarcoma that followed? Before denying a causative relation one should point out some reasonably likely cause other than the injury. Before attributing the entire incident to the so-called laws of chance, one should consider the incidence rates of sarcomas of the sternum and of contusions of the sternum on the entire population and then estimate the chances of the occurrence of such a contusion and such a sarcoma coincidentally in site and in immediately chronological sequence. If it be admitted that a contusion has ever caused a sarcoma of the sternum, what ground is there for believing that other traumas may not cause other malignant growths? The relation between malignant growths and cleancut incised wounds and punctured wounds made with sharp instruments may merit separate consideration, for I cannot recall ever seeing a report of a claim for compensation based on the occurrence of a malignant growth as the result of such an injury. Even so, one must not overlook the etiology of keloids, sometimes attributed to even such trauma.

A large financial interest is involved in the problem here discussed. An employee who suffers from a malignant growth caused by a trauma arising out of and in the course of his employment is in most jurisdictions, if not in all, entitled by law to compensation for the injury, to be paid by the employer by whom he was employed when the injury was received. The presence of such a growth at the site of the injury cannot enter into the determination of compensation if the element of causation is not proved. Proof need not be conclusive or beyond a reasonable doubt. The award is made according to the preponderance of the weight of the evidence submitted by employee and employer. If a single trauma can never by any possibility cause a malignant growth, however, every award in favor of the employee in such a case obviously imposes an injustice on the employer, no matter what the weight of the evidence may be.

To prevent such injustice it has been urged that the dictum which denies the possibility of a causative relation between any single trauma and a malignant growth subsequently appearing on the site of that trauma be generally accepted. The universal acceptance of that dictum would go a long way toward preventing such injustice. But might it not give rise to injustice equally extensive and even more grave? It would certainly tend to deter injured workmen from filing claims based on such injuries and growths, hinder lawyers in the prosecution of such claims, embarrass physicians, regardless of their own studies, experience and observation, sought as witnesses in support of such claims, and operate, subconsciously or otherwise, to warp the judgments of boards, commissions and courts required to pass judgment. For possible injustice to individual employers, the adoption of the dictum of noncausation would substitute certain mass injustice to many employees, if it should prove unfounded, as the case stated at the beginning of this communication indicates that it is. And by the time the fallacy of the dictum was demonstrated many employees, and many persons in other walks of life who but for it might have sought damages for injuries suffered at the hands of others, will have lost their rights to redress, through the limitations of time for presenting their claims fixed by the workmen's compensation acts and statutes of limitation and through the disappearance of essential witnesses.

Have biology and medical science already determined the causes of malignant growths in the human body so certainly as to call for affirmative action to cause the adoption universally of the dictum that no single trauma ever has caused a malignant growth or ever can do so? Do available records indicate that under existing medical and legal procedure so many employers are being unjustly required to pay compensation for malignant growths due to single traumas as to require a revision of medi-

cal opinion with respect to the cause or causes of such growths? If neither of these questions can be answered in the affirmative, why not wait for further evidence as to the causes that operate to produce such growths before undertaking to reform medical opinion? WILLIAM C. WOODWARD, M.D., Washington, D. C.

"YAWS, CUTANEOUS LEISHMANIASIS AND PINTA"

To the Editors:—With reference to Dr. Howard Fox's communication (THE JOURNAL, April 8) replying to my comments (March 4) regarding his article "Yaws, Cutaneous Leishmaniasis and Pinta" (THE JOURNAL, Oct. 23, 1943) I should like to point out:

1. If an incidence of 4 per cent of the macular rash of yaws is considered "the equivalent of being nearly always absent," then we are in agreement as to this type of lesion. As the macular rash appears early in the course of the disease its incidence should be calculated on the total number of lesions of all types seen in persons with a history duration of one year or less. My calculations on this basis gave an incidence of 6.5 per cent. Either figure (4 or 6.5 per cent) seems to me significant, particularly as in some cases there may be only a few macules and the tendency is for them to disappear early—perhaps before the patient comes up for examination. For purposes of comparison I should be glad to know what, in the experience of others, is the incidence of the roseola rash of syphilis.

2. In support of his statement "In the early stages the disease may be permanently cured by three successive injections of neoarsphenamine," Dr. Fox mentions the results of Morse, quoted by Strong, on 1,064 cases treated in Santo Domingo (in my edition Stitt Moss is quoted) and revisited after five years. Moss (again in my edition) found that 46.5 per cent of the cases reexamined—i. e., 419—remained uncured. He also quotes Strong to the effect that in the Philippines with two injections as the rule 94.3 per cent of clinical cures resulted. No mention is made of the period over which these cases in the Philippines were followed up or if by the term "clinical cure" a temporary clearing up only of the lesions is meant.

I quoted in my previous article the percentages of persistent positive Wassermann reactions at six, twelve and eighteen months in a series of 411 cases in which six successive injections of neoarsphenamine had been administered. I should have added that it was from these persistent positive reactions the relapsing lesions developed; that infectious relapsing lesions were more frequent during the first year following treatment of early cases than in the second or subsequent years; that environmental and climatic conditions were major factors in determining the time and percentage of relapses (consequently patients should be revisited in their districts toward the end of the rainy seasons to determine the real effects of treatment—an important point).

In a small series of 209 persons treated with four to six injections of neoarsphenamine (average 5.5 injections per patient) and revisited at six, twelve, eighteen and twenty-four months later, 28 had relapsing lesions (6 after six months, 7 after twelve, 9 after eighteen and 6 after twenty-four), a percentage of 13.4 relapsing cases. This percentage was found to be still higher for patients receiving one to three injections. Cases may relapse repeatedly in spite of an additional two to three injections after each relapse. The figure 28 represents the number of first relapses; further relapses are not included.

On the other hand, before an estimate can be made of the results of treatment there should be a clear picture as to the course of the disease in cases in which treatment has never been given. In Jamaica active lesions attributable to yaws are quite rare in patients who give a history of yaws of thirty or more years' duration.

Moss revisited his 1,064 patients in Santo Domingo after a period of five years. In two areas in Jamaica 1,520 persons with a history of yaws of five years upward who maintained that they had never had treatment by injections were seen and 1,424, or 93.65 per cent, showed no clinical evidence of active yaws; only 96, or 6.64 per cent, had such evidence. In these same areas 467 patients gave a history of yaws of four years or less without receiving treatment; 308, or 65.95 per cent, had active yaws lesions; 159, or 34.05 per cent, had no active lesions.

My contention is that specific treatment early in the course of the disease is of value primarily in limiting the spread of the disease in any community where environmental conditions cannot be speedily improved. Such treatment (even with six or more injections) does not necessarily indicate that the disease is cured. I would suggest that to regard the absence of physical lesions as evidence of cure is no more logical than to do so in cases of syphilis.

It would be comparatively easy to clear endemic areas of yaws if one to three injections could cure the disease. The fact is that there will always be some cases of relapsing infectious lesions from which a further spread of the disease by contagion is possible.

H. D. CHAMBERS, M.D.,
General Hospital,
Kingston, Jamaica.

[The letter was referred to Dr. Fox, who replies:]

1. Dr. Chambers has made it appear that I considered a 4 per cent incidence of the macular eruption to be the equivalent of being "nearly always absent." In my answer to his communication in THE JOURNAL, April 8, I distinctly said that only one author had observed such an incidence. All others of long experience with yaws either failed to mention a macular eruption or definitely said that it did not occur in yaws.

2. The statement quoted from Colonel Strong was to the effect that in the early stages the disease *may* (italics mine) be permanently cured by three successive injections of neoarsphenamine. This would not mean that such a result was always bound to occur.

Dr. Chambers said that in his own series of 209 cases treated by an average of 5.5 injections of neoarsphenamine he found 13.4 per cent of relapses after periods of observation varying from six to twenty-four months. The freedom from relapse in 86.6 per cent of his cases supports my opinion of the curability of yaws in the early stages, certainly when compared with the curability of syphilis.

HOWARD FOX, M.D., New York.

PRIZE WINNING MONOGRAPHS IN BRAZIL

To the Editor:—In THE JOURNAL, May 6, a mistake was noted in the letter from Brazil. The monographs are in error, since separate competitions were entered during the year, and the following is a correct listing of the prize winning monographs:

1. "History of Leprosy in Brazil and the Geographic Distribution of the Disease," by Flavio Maurano.
2. "Etiology and Pathology of Leprosy," by Abrahão Rotberg and Luiz Marino Bechelli.
3. "Epidemiology and Control of Leprosy," by Nelson Sousa Campos, Abrahão Rotberg and Luiz Marino Bechelli.
4. "Clinic and Therapeutic of Leprosy," by Luiz Marino Bechelli, Abrahão Rotberg and Flavio Maurano.

LUIZ MARINO BECHELLI, M.D.,
Post-Graduate Medical Hospital,
New York.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Conviction of Limited Practitioner for Exceeding the Scope of His License.—The Bureau of Medical Education and Licensure of Pennsylvania¹ in 1915 issued a limited license to Allison which conferred on him "the right to treat the sick by Herbs and Massage . . . upon request of a person duly authorized to prescribe the same." Twice previous to the institution of the action here involved he was convicted of having exceeded the authority granted him by this license and of engaging in the practice of medicine and surgery. Both convictions were upheld by the superior court of Pennsylvania. *Commonwealth v. Allison*, 103 Pa. Superior 140, 156 A. 812; *id.* 132 Pa. Superior 606, 1 A. (2d) 920. Again, in the case here abstracted, he was indicted for and convicted of exceeding the scope of his limited license and engaging in the practice of medicine and surgery without restriction. He appealed to the superior court of Pennsylvania.

Either Allison, said the superior court, has no respect for the law or he is mentally incapable of understanding the limitations implicit in the form of license he possesses. For not only did the prosecution show that, at the times charged in the indictment, he accepted patients, examined them, diagnosed their ailments and prescribed treatments; he glibly admitted these practices from the witness stand. And there is not even the pretense that he limited his patients to those referred for treatment by a properly licensed physician; in fact, one has the impression from reading his testimony that he regards all orthodox physicians as either fools or knaves and will have little or nothing to do with them. Having twice appealed to us in vain one would expect that in this, his third, appeal the ingenuity of counsel, challenged by almost overwhelming odds, would produce a somewhat novel approach to the problem. We have not been disappointed. Allison now contends that, in restricting him to the treatment of patients referred to him by licensed physicians, the licensing agency—composed, according to him, of "professional competitors"—has arbitrarily discriminated against him; that there is no statutory authority in Pennsylvania for such a narrow limitation on his authority and that the limitation contravenes the Fourteenth Amendment to the Federal Constitution.

True, continued the court, there is no express statutory authority for the particular limitation complained of by Allison. The Pennsylvania medical practice act gives the bureau broad, discretionary powers to establish a system of special licensure and to issue to persons who fulfil such special qualifications as the bureau provides a license to practice one or more of the limited branches of medicine or surgery. The constitutionality of this provision was upheld in *Long v. Metzger*, 301 Pa. 449, 152 A. 572. Of necessity the bureau may make discriminations; they are inherent in the nature of the functions it performs. Yet we must grant that the acts of the bureau may always be subjected, by one affected, to the test of reasonableness under the Fourteenth Amendment. But, so far from being unreasonable, the requirement imposed by the bureau that practitioners of this kind should treat patients only at the request of, and hence under some supervision by, a licensed physician is a necessity if the public is to be protected adequately against exploitation.

Allison, continued the superior court, is a quack of the worst sort. It is easy to see why, if he were compelled to wait for

patients referred to him, by physicians, he would have no practice. At the trial there was no proof of the chemical ingredients of the pills and nostrums he sold to his patients nor the type of massage he employed. But the miracles he professed to be able to accomplish would make the witchery of the Middle Ages seem by comparison an infant and underdeveloped craft. He professes to be a "bloodless surgeon, a botanic physician." When asked how he would cure a case of appendicitis he said:

That is very easy. That would be cured in one hour's time ordinarily without shedding any blood or making any incision or like that. That is easily cured in one hour and a patient is ready to go to work in one hour.

When asked what he would do with ruptured appendix, he said:

Why, my friend, I have been practicing forty-three years and I have yet to see the physician that has ever saw [sic] a ruptured appendix.

He could remove diseased tonsils without cutting:

By the use of herbs taken internally and massage to the throat, cure any case of tonsils, just—well, I'll say within a week or so.

He professed to have cured many cases of cancer, and as for paralysis:

Often times paralysis is caused by an obstruction of circulation and by removing that obstruction in a few minutes time the party has the full use of their arms or legs.

It makes one shudder, continued the court, to think that a man like this should be entrusted with any part of the responsibility for the diagnosis or treatment of human disease. The story of this case is more persuasive than any abstract argument could possibly be of the wisdom of the bureau in limiting such practitioners to treatments requested by licensed physicians.

Accordingly, the judgment of conviction was affirmed.—*Commonwealth v. Allison*, 38 A. (2d) 535 (Pa., 1944).

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL*, Nov. 4, page 656.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Nov. 13-15. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: New York, June 8-9. Final date for filing application is March 12. Sec., Dr. George M. Lewis, 66 E. 66th St., New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written*. Feb. 19. Final date for filing application is Dec. 15. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Spring. Final date for filing application is Feb. 1. Sec., Dr. Paul C. Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written*. Part I. Various centers, Feb. 3. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: New York, June, Chicago, October. Final date for filing application is Dec. 1. Sec., Dr. S. Judd Beach, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 5-8. Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Oral*. New York, April 14-15. Final date for filing application is Dec. 15. Chicago, May 19-20. Final date for filing application is Jan. 19. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral*. New York, June 3. Final date for filing application is May 1. Sec., Dr. B. R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

1. Now officially designated as the State Board of Medical Education and Licensure.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below

American Journal of Diseases of Children, Chicago

68: 83-156 (Aug.) 1944

Clinical Adequacy of Single Measurement of Vitamin A Absorption E. L. Pratt and Kathleen R. Fahey —p. 83

Group Psychotherapy for Withdrawn Adolescents. J. C. Solomon and Pearl L. Axelrod —p. 86

*Management and Prognosis of Megacolon (Hirschsprung's Disease). Review of 24 Cases K. S. Grimson, H. N. Vandergrift and H. M. Dratz —p. 102

Meningococcal Meningitis. Review of 100 Cases K. Glaser —p. 116

Poliomyelitis. III. Analysis of Results Following Treatment as Reported in Recent Literature. J. A. Toomey and P. M. Kohn —p. 124

Management and Prognosis of Megacolon (Hirschsprung's Disease).—Grimson and his co-workers review the records of patients with megacolon seen since the opening of Duke clinic in 1930. The present status of the patients has been determined by correspondence and by return visits. Of 24 patients with megacolon, 21 were treated by conventional medical management, consisting chiefly of diet, laxatives, enemas and parasympathomimetics, occasionally supplemented by sympathectomy. Three of the 21 patients required emergency laparotomy. A severe fecal impaction was removed in 1. Volvulus of the sigmoid colon was reduced in 2. Six of the 21 patients have undergone a remission of symptoms without surgical intervention. One patient underwent a remission of symptoms after sympathectomy and is well at the age of 17. Seven have continued to have mild to severe symptoms and at an average age of 15 are receiving medical treatment. Five patients, including 1 of the 3 who had a laparotomy, have died. The remaining 3 of the 24 patients presented alarming symptoms and were treated by one stage resection of the megacolon and ileosigmoidostomy. These 3 are now living and well. Medical management was supplemented by sympathectomy for 4 of the 24 patients. The gross pathologic picture was not significantly altered. One sympathectomized patient improved and is living and well at the age of 17. Another improved for three years and then died at the age of 24 with an acute impaction and perforation of the colon. Two others experienced difficulty after sympathectomy. The initial observations indicate three types of involvement of the colon, and the follow-up studies warrant classification of the 24 patients into three groups. The first group, of 12 patients, had uniform involvement of the entire colon terminating in a dilated or easily dilatable rectum. Eight are now living and evacuating their colons readily. It appears that protracted medical management of patients in this group is indicated as long as adequate nutrition can be maintained and persistent abdominal distention avoided. The 7 patients of group 2 had uniform dilatation of the proximal segments of colon terminating in a normal segment of bowel, usually in the sigmoid region, and a normal rectum. Four receiving conventional management died. The remaining 3, with enormous megacolons, were treated by resection of the megacolon and anastomosis between the terminal portion of the ileum and the remaining stump of normal sigmoid colon. These 3 are living and well. Patients in this group demonstrated greater abdominal enlargement than the other patients. The third group comprised 5 patients who had enormous enlargement of the sigmoid colon or of the sigmoid and descending colon, with or without involvement of the proximal portions of the colon and of the rectum. The 5 are now living. Two free from symptoms and 3 with moderately severe symptoms. It seems that protracted medical management of patients in this group is justified.

American Journal of Physiology, Baltimore

142:1-152 (Aug.) 1944. Partial Index

Design of Ballistocardiograph. J. L. Nickerson and H. J. Curtis —p. 1

Study of Substances in Blood Serum and Platelets Which Stimulate Smooth Muscle Marjorie Bass Zucker —p. 12

Rate of Entrance of Radio Sodium into Aqueous Humor and Cerebrospinal Fluid. M. B. Visscher and C. Carr —p. 27

Influence of Temperature on Spinal Cord Damage Caused by Asphyxiation A. van Harreveld and D. B. Tyler —p. 32

Hemoglobin Concentration of Blood of Intact and Splenectomized Dogs Under Pentobarbital Sodium Anesthesia, with Particular Reference to Effect of Hemorrhage. D. T. Carr and H. E. Essex —p. 40

Augmentation of Left Coronary Inflow with Elevation of Left Ventricular Pressure and Observations on Mechanism for Increased Coronary Inflow with Increased Cardiac Load. D. E. Gregg and R. E. Shipley —p. 44

Respiratory Effects on Tilling of Ventricles During Prolonged Diastole Mary C. Patras, J. M. Brookhart and T. E. Boyd —p. 52

Tissue Electrolyte at Low Atmospheric Pressures. D. C. Darrow. —p. 61

Depression of Normal Erythrocyte Number by Soybean Lecithin or Choline. J. E. Davis —p. 65

Palmar Skin Resistance During Standard Period of Controlled Muscular Activity as Measure of Physical Fitness and Fatigue A. H. Ryan and E. L. Ranssen —p. 68

Maintenance of Normal Serum Calcium by Parathyroid Gland in Nephrectomized Dogs E. P. Monahan and S. Freeman —p. 104

Synergistic Effect of Caffeine on Histamine in Relation to Gastric Secretion J. A. Roth and A. C. Ivy —p. 107

Sensitivity of Respiratory Center to Hydrogen Ion Concentration M. G. Banus, H. H. Corman, V. P. Perlo and G. L. Popkin —p. 121

Energy Expenditure in Swimming P. V. Karpovich and N. Millman —p. 140

Radioactive Phosphorus Studies on Hexosemonophosphate Metabolism in Resting Muscle. J. Sacks —p. 145

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

28: 529-660 (Sept.) 1944

Review of 2,144 Courses of Rapid Treatment for Early Syphilis E. W. Thomas and Gertrude Wexler —p. 529

*Intensive Chemotherapy of Early Syphilis. A. W. Neilson, L. F. Blaney, L. J. Stephens and R. W. Maxwell —p. 533

Contact Investigation in Gonorrhea. N. W. Guthrie —p. 571

Syphilis in Gonorrhea Patients and Contacts N. W. Guthrie —p. 583

*Polyarticular Arthritis and Osteomyelitis Due to Granuloma Inguinale J. Lyford III, R. B. Scott and R. W. Johnson Jr. —p. 588

*Penicillin in Treatment of Granuloma Inguinale R. A. Nelson —p. 611

Enhancement of Virulence of Gonococcus for Mouse. C. P. Miller, with technical assistance of E. Tamani —p. 620

Susceptibility of Sulfonamide Resistant Gonococci to Penicillin A. W. Frisch, with technical assistance of Beatrice Behr, R. B. Edwards and M. W. Edwards —p. 627

Statistical Studies in Female Gonorrhea with Evaluation of Yeast Supplement in Gonococcus Isolation P. Rosenblatt, Eddy Myer and Lillian Robbins —p. 634

Intensive Chemotherapy of Early Syphilis.—The treatment routine used by Neilson and his collaborators at Isolation Hospital in St. Louis was that devised by Chargin; 240 mg of mapharsen was given daily for five consecutive days, totaling 1,200 mg. The daily dose of drug was given in 2,000 cc of 5 per cent glucose solution dripped intravenously over a twelve hour period. Because fatalities resulted in small persons, the total dose for persons weighing less than 125 pounds (57 Kg.) was reduced to 900 mg. The 5 per cent glucose solution was later replaced by a 10 per cent solution, and the daily administration time was reduced from twelve hours to eight hours. Intensive therapy was completed 502 times on 487 patients. A few individuals were rejected because of a history of sensitivity to arsenic. In over one half of the cases insoluble bismuth was given in an attempt to create a chemotherapeutic regimen of maximum effectiveness. The authors describe and evaluate early and delayed reactions and discuss the 4 fatalities. Thirty-seven per cent of the first 414 patients receiving intensive therapy failed to make a single contact with the follow-up clinic. The time interval between treatment and the achievement of a negative Kahn test averaged 4.3 months in the group receiving mapharsen alone and 2.8 months in the group that received a bismuth compound in addition to mapharsen. Fifteen per cent of all patients followed for five months or longer developed serologic or mucocutaneous relapse. Many of these were given a second course of intensive treatment. Twenty pregnant women were treated and 17 were followed until delivery had occurred. Only 2 infants had definite congenital syphilis, and 2 babies had positive Kahn reactions. The follow-up of treated patients has not yet been long enough for a proper evaluation of the results. The authors believe that the rate of complete cure will not be less than 70 per cent.

Arthritis and Osteomyelitis Due to Granuloma Inguinale.—Lyford and his associates reported previous observations on a case of disseminated granuloma inguinale with polyarticular arthritis and osteomyelitis in which the Donovan bodies were found on microscopic examination and were grown in continuous tissue cultures of material from the bone and joint lesions. They have also seen 2 cases of osteomyelitis (forearm and spine) in which the Donovan bodies were demonstrated in the lesions. In 1 case there was a systemic dissemination of the disease with a massive polyarticular arthritis and ultimately ulceration of many of the joints, and a widespread destruction of the bones. In another there was involvement of two vertebrae and a hip joint communicating with sinus tracts presenting in the inguinal regions. The third patient had lesions in the bones of a hand and forearm but no joint involvement. These cases add further proof that granuloma inguinale can be a systemic as well as a local disease. All patients showed persistent anemia and gradual loss in weight. All had irregular spiking temperatures over a long period of time. The activity of the lesions and the systemic manifestations were characterized by recurring episodes of spontaneous remissions and exacerbations. The arthritis had an insidious onset with migratory pains in several joints and then swelling of several joints with pain locally but little free fluid. There was a slow subsidence into atypical "rheumatoid arthritis," followed by a recurrence of the acute swelling and pain of multiple joints, ending after many months in ulceration from within outward of many of the joints. Exploration of an elbow joint during the period of quiescence showed the synovia to be thickened and friable, but the articular cartilages were clean and smooth. The operative incision into the infected tissue of the joint healed by first intention and remained healed. The bone lesions on radiographic examination showed little or no sequestrum or involucrum formation and a lytic type of reaction. The lesions contained no pus and consisted of friable granulation tissue. Donovan bodies were seen in material from the bone and joint lesions in 2 cases and in material from the sinus tracts communicating with the involved bones in the third case.

Penicillin in the Treatment of Granuloma Inguinale.—Nelson administered penicillin to 2 patients with chronic granuloma inguinale. The diagnosis was proved in both cases by biopsy, which in each case showed Donovan bodies. One patient was given 1,360,000 Florey units of sodium penicillin by intramuscular injection in a period of four and one-half days; the other received 2,800,000 units during a fifteen day treatment course. No significant change was observed in the lesions in either patient in the following thirty to forty days. Donovan bodies were still present in the tissues of the first patient twenty-seven days after therapy was begun.

Archives of Internal Medicine, Chicago

74: 81-154 (Aug.) 1944

- *Diabetes Insipidus: Clinical Observations in 42 Cases. G. M. Jones.—p. 81.
- Disease of Mitral Valve: Its Effect on Pattern of Electrocardiogram. B. V. White, R. C. Parker Jr. and A. M. Master.—p. 94.
- *Vasodepressor and Carotid Sinus Syncope: Clinical, Electroencephalographic and Electrocardiographic Observations. G. L. Engel, J. Romano and T. R. McLin.—p. 100.
- Intestinal Malabsorption Associated with Tuberculosis of Mesenteric Lymph Nodes. A. Klein and W. B. Porter.—p. 120.

Diabetes Insipidus.—Jones reports 42 cases of diabetes insipidus treated at the University Hospital at Ann Arbor, Mich. In 34 of these the etiologic factors were clinically or pathologically determined. Diabetes insipidus is a symptom complex produced by injury to the supraopticohypophyseal tract and not a specific etiologic entity. In any case of diabetes insipidus a thorough and repeated examination should be made to determine the etiologic factors. Urine concentration tests indicate that patients with diabetes insipidus receiving a limited intake of fluid continue to secrete urine of low specific gravity, with resultant loss of body weight. Such a response indicates organic damage along the supraopticohypophyseal tract. Therapy should be directed toward the etiologic factor. Thus in some cases of neoplasm of the hypothalamus and pituitary and of Hand-Schüller-Christian disease a good response to roentgen irradiation is obtained, and antisiphilitic therapy corrects the diabetes

insipidus resulting from syphilis. As diabetes insipidus is not infrequently the first symptom in cases of neoplasm, occurring eight months and six years before other evidence of the malignant growth in 2 of the cases reported here, roentgen irradiation of the hypothalamohypophyseal region may be worth while when the cause of the diabetes is undetermined. Of the various methods of administration of posterior pituitary as replacement therapy in the absence of the antidiuretic principle, intramuscular injection of pitressin tannate in oil seems the most desirable. Intranasal application of pitressin in jelly was the least satisfactory. Use of a low salt diet as an adjunct to other therapy may be worth a trial. Thyroidectomy should not be performed for diabetes insipidus unless there are other specific indications for the procedure.

Vasodepressor and Carotid Sinus Syncope.—Engel and his co-workers report the clinical, electroencephalographic, electrocardiographic and circulatory responses observed during a variety of syncope reactions, including syncope provoked by venipuncture, by distention of the duodenum, colon, rectum or vagina, by hyperventilation and by carotid sinus reflex. Eighteen patients and volunteer subjects were studied. In some instances syncope was a chance occurrence in the course of an unrelated experiment. In other instances the clinical history suggested that a certain procedure such as distention of viscera or massage of the carotid sinus would provoke syncope. Vasodepressor syncope was provoked in 9 patients by venipuncture, by distention of the rectum, colon, duodenum or vagina, by hyperventilation or by stimulation of the carotid sinus. In addition, 6 cases of the cardioinhibitory type of carotid sinus syncope and 3 cases of the cerebral type were studied. Complete unconsciousness, characterized by unawareness, muscular relaxation and falling, was always accompanied by high voltage slow waves in the electroencephalogram, regardless of the mechanism by which unconsciousness was provoked. Lesser changes in consciousness, such as lightheadedness, giddiness and transient unconsciousness, were associated with less obvious slowing of the electroencephalogram, loss of alpha activity or no change at all. In 2 cases of the cerebral type of carotid sinus syncope the development of contralateral focal neurologic signs and symptoms without loss of consciousness was associated with abnormal waves from the ipsilateral cortex. Vasodepressor syncope could be provoked by a wide variety of sensory stimuli, but the significance of the stimulus to the subject seemed to be more important than the specific modality involved. Most of the symptoms of vasodepressor syncope were associated with falling arterial blood pressure, and unconsciousness did not develop until blood pressure had fallen to a low level. Symptoms could be relieved by returning the subject to the recumbent position, but they often recurred if the subject stood up again, even if the original stimulus had been withdrawn. The derangement in circulatory dynamics was apparently compensated for but not corrected by assumption of the recumbent position, presumably by avoiding the pooling effects of gravity. Recovery of consciousness may occur in the erect position; convulsive movements and increase in muscle tone seemed to aid recovery, but they were not essential. The value of having the patient exercise before standing up was evident.

Archives of Ophthalmology, Chicago

32: 89-166 (Aug.) 1944

- Chronic Keratoconjunctivitis Associated with Nocardia. W. L. Benedict and H. A. Iverson.—p. 89.
- Sarcoidosis with Retinal Involvement: Report of 2 Cases. S. Goldberg and F. W. Newell.—p. 93.
- White Rings of Cornea: Report of Microscopic Examination. M. W. Jacoby and R. Dominguez.—p. 97.
- Intranasal Drainage for Cure of Chronic Infection of Tear Sac: Initial, Transcanalicular, Inverted U Shaped Incision to Facilitate Full Opening of Tear Sac. D. J. Morgenstern.—p. 101.
- Buccal Mucous Membrane Grafts in Treatment of Burns of Eye. R. Siegel.—p. 104.
- Treatment of Metastatic Meningococcal Endophthalmitis: Report of Case. A. C. Krause and W. Rosenberg.—p. 109.
- Strabismus in Adults: Analysis of Operative Results in 65 Cases. I. I. Shure.—p. 113.
- Bilateral Teratoid Tumor of Limbus. E. Rosen.—p. 120.
- Intrinsic Variability of Astigmatic Errors. J. I. Pascal.—p. 123.
- Foster Kennedy Syndrome with Fusiform Aneurysm of Internal Carotid Arteries. I. S. Tassman.—p. 125.
- Pathogenesis of Acute Glaucoma. L. Hess.—p. 129.

Bull. of the U. S. Army Med. Dept., Washington, D. C.
80: 1-122 (Sept.) 1944

- *March Fracture: Report of 313 Cases. C. W. Hullinger and W. L. Tyler.—p. 72.
*Colorado Tick Fever: Report of 39 Cases. J. D. Collins.—p. 81.
*Meningococcemia. L. Ochs Jr., T. Weiss and M. Peters.—p. 86.
*False Positive Serologic Reactions for Syphilis: Report of 100 Cases Following Routine Immunizations and Upper Respiratory Infections. A. B. Loveman.—p. 95.
Postoperative Problems Following Perforation of Colon. B. P. Colcock.—p. 106.
Method for Instructing Medical Technicians. D. E. Casad, T. A. Broderick and H. T. Haver.—p. 109.
Treatment of Mentally Disturbed Soldiers Overseas. M. Moore and P. D. MacLean.—p. 113.

March Fracture.—Hullinger and Tyler observed at Camp Wheeler 300 patients with 313 march fractures. Each patient showed either a fracture line or callus formation by x-ray examination. An additional large number of patients were seen who had many of the earlier signs of march fracture but never positive x-ray signs. There were about 450 patients in this group. The incidence of march fractures at this camp greatly increased beginning in March 1942, as a result of a training order issued in February, which stated that all trainees would carry rifles and full packs at all times during the training program, that the men would march by foot from one area to another instead of riding, and that they would move to adjacent areas frequently on the double time. This increased the admission to the hospital for march fractures to a peak of 66 for the month of May. On May 24 a memorandum was issued lessening the strenuousness of the training program, with the result that the number of cases fell off in June to 44 and in July to 17. While this type of fracture has been reported as occurring in the tibia, fibula, femur, calcaneus, pelvis and cuneiform, it is most frequently found in the second and third metatarsal bones. Prior civilian occupation may be a mild contributory factor in causing early fatigue. The weight of patients and their age do not seem to be contributory. The mechanism of fracture and healing would seem to be as follows: Because of the repeated minimal trauma, there is an incomplete fracture of a few of the bony trabeculations of the shaft, which is most often not visible on x-ray examination. This is followed by hemorrhage, which, being on the surface, produces an elevation of the periosteum. New bone is formed in the hematoma. Calcium deposits are seen in this area at an early date. If the trauma continues there is fracture of additional bone trabeculations and additional hemorrhage, further elevating the periosteum and giving rise to additional osteogenesis. There is then slight absorption of calcium at the fracture ends with the dehiscence becoming visible by x-ray examination. If the trauma ceases, the fracture proceeds to orderly healing with complete repair. Treatment should be complete immobilization to prevent motion at the fracture site. Complications are very few in cases treated by complete immobilization.

Colorado Tick Fever.—Collins states that cases of Colorado tick fever were encountered in May and June 1943 at Camp Carson Station Hospital. Thirty-nine men became ill with fever, chills, headache and myalgia lasting from one to two days, followed two days later by a relapse of similar character. A leukopenia was an almost constant finding. All of the men had sojourned in tick country, and the majority gave a history of being bitten by ticks. All were between the ages of 20 and 40, in supposedly good health until the present illness. In every instance a history was obtained of having bivouacked for several days in the vicinity of Lake George, near Colorado Springs, a region notorious for the number of ticks found there. All ticks removed in the hospital from these patients were identified as *Dermacentor andersoni*. Therapy was symptomatic, although sulfonamide drugs were used in 6 cases without noticeable benefit. Salicylates and codeine relieved the myalgia and headache to a large extent, and dehydration was combated by copious fluid, given intravenously when necessary. Laboratory facilities to investigate the cause further were lacking. Attempts to reproduce the disease in laboratory animals by others have been unsuccessful and the etiologic agent is as yet unknown.

Meningococcemia.—Ochs and his associates report that 6 cases of chronic meningococcemia without accompanying meningitis were recognized from a station hospital in this country during and following an outbreak of meningococcal meningitis. Chronic meningococcemia is characterized by irregular fever, arthralgias, myalgias and a skin eruption, the most characteristic lesion being a rose colored macule with a vesicular, pustular or petechial center of pinhead size. The diagnosis of meningococcemia can be suspected on clinical findings, but to the laboratory falls the responsibility of demonstrating the causative agent. Blood cultures for growing meningococci are more often positive if the blood is drawn when the temperature is rising or at its peak. Attempts to isolate organisms from the skin lesions were unsuccessful. Acute fulminating meningococcemia with or without meningitis is another form of meningococcal infection. Nine cases of this form have appeared at the authors' hospital during 1942, 1943 and 1944. One patient died suddenly before the disease was recognized, and 1 patient died suddenly twelve hours after treatment from pulmonary edema. The disease is so fulminating that one cannot wait for a confirmatory blood culture before instituting treatment. At present any patient showing a diffuse petechial, purpuric or macular rash, early coma or manifest restlessness with a leukocytosis is considered to have fulminating meningococcal septicemia. The blood culture is usually positive for meningococci. In 4 patients the diagnosis was immediately confirmed by demonstrating gram negative diplococci in a film of tissue juice obtained by cutting into a petechia. The authors were unable to determine the presence of hemorrhage into the adrenal glands. Although the clinical course of this disease is similar to the Waterhouse-Friderichsen syndrome, the authors have not diagnosed their cases as such. The histories of 3 patients with acute fulminating meningococcemia are described. The treatment of the fulminating cases is with one-sixth molar sodium lactate solution in isotonic solution of sodium chloride; sodium sulfadiazine intravenously and intramuscularly; adrenal cortex extract intravenously and intramuscularly; meningococcus antitoxin intravenously; 5 per cent glucose and saline solution intravenously; sodium citrate given with sulfadiazine orally; oxygen; recording of blood pressure, pulse, pulmonary signs for pulmonary edema and urinary output every two or three hours.

Indiana State Medical Assn. Journal, Indianapolis**37: 427-554 (Sept.) 1944**

- Study of Upper Respiratory Infections. F. E. Ball and C. D. Berry.—p. 427.
Combat Flight Surgeon in England. O. C. Olson.—p. 430.
Venereal Disease and Flying Personnel. R. Dyar and J. R. Scholtz.—p. 435.
Effect of Diet on Gastrointestinal Symptoms at Altitude. J. H. Tillisch.—p. 439.
Reactions of Nasopharynx to Heat, Cold and Disease, with Some Therapeutic Considerations. P. S. Mountjoy.—p. 443.
*Sulfadiazine Prophylaxis of Acute Infectious Diseases. H. A. Warren.—p. 447.
Low Back Pain. J. V. Luck.—p. 452.

Sulfadiazine Prophylaxis of Acute Infectious Diseases.—Warren reports experiences in the use of sulfadiazine in controlling both sick call and hospital admissions from acute infectious diseases in more than 9,000 men at the Army Air Forces Technical Training School, Truxa Field, Madison, Wis. This study was conducted as a part of the Army Air Forces Rheumatic Fever Control Program. Sulfadiazine in a prophylactic dosage of 3 Gm. once weekly proved ineffective in reducing the incidence of acute infectious disease among a group of 140 soldiers, but in prophylactic doses of 1 Gm. daily it effectively reduced the incidence of certain acute infectious diseases among 9,000 soldiers. This effect was evident both on admissions to the outpatient department and on hospital admissions for acute infectious diseases. Diseases caused by beta hemolytic streptococci, scarlet fever and nasopharyngitis due to streptococci were most effectively influenced. A definite effect was also apparent on the incidence of rheumatic fever occurring at a later period than the effect on acute hemolytic streptococcus disease. There was no effect on diseases caused by virus infection or of unknown etiology under this method of prophylaxis. Among 9,000 men, only 34 toxic reactions were encountered, and none of them were serious.

Journal Industrial Hygiene & Toxicology, Baltimore

26: 211-254 (Sept.) 1944

- Aluminum Therapy in Silicosis: Experimental Study.* Donald E. Cummings Memorial Lecture, St. Louis, May 11, 1944. L. U. Gardner, M. Dworski and A. B. Delahant.—p. 211.
- Determination of Barium in Atmospheric Dusts.* H. Yagoda.—p. 224.
- Cadmium Poisoning in Industry: Report of 5 Cases, Including One Death.* L. W. Spolyar, J. F. Keppeler and H. G. Porter.—p. 232.
- Absolute Efficiency of Impinger and of Electrostatic Precipitator in Sampling of Air Containing Metallic Lead Fume.* R. G. Keenan and L. T. Fairhall.—p. 241.
- Liver Injury in Dogs Exposed to Trichloroethylene.* J. Seifter.—p. 250.
- Cadmium Poisoning.**—According to Spolyar and his associates cadmium poisoning in industry occurs from the accidental absorption of fumes or dust by way of the respiratory tract, seldom by ingestion. A symptom complex develops that is primarily referable to the respiratory tract and is manifested within four to eight hours by irritation of the nasopharynx, cough, headache and a metallic taste in the mouth. This is followed by a latent period of twenty to thirty-six hours, when the chief complaints are dyspnea and severe pain in the chest. Gastrointestinal complaints may develop, depending on the amount of cadmium swallowed. Cadmium poisoning by ingestion is usually manifested by symptoms referable to the gastrointestinal tract, namely persistent vomiting for a period of four to six hours with or without diarrhea. Cadmium, being a powerful emetic, seldom produces death when taken orally. This dual symptom complex may explain the scarcity of reported cases of cadmium poisoning occurring as a result of inhaling cadmium fumes or dusts, in that the gastrointestinal symptoms may have been looked for and were missing. The authors report the histories of 5 men who worked in a shop for flanging steel inlet pipes. Flanging was accomplished by a team consisting of two men, one known as the heater and the other as the flanger. The heater heated one end of the 6 inch pipe by means of a propane-oxygen blowtorch until it was cherry red. The flanger created a flange, or bevel, on the heated end of the pipe. This work had been done for six months, when a different type of pipe was supplied. Soon after beginning work, the men noticed more smoke than usual and a dense yellowish brown fume being emitted from the pipe. After all the 5 men who had worked on these pipes for about four hours each had become ill, the operation was discontinued. Death of 1 of these men, who had been longer exposed to the cadmium fumes, led to inquiry by the insurance company, which disclosed that the pipe was coated with cadmium. The authors present data on 38 additional cases of cadmium poisoning by inhalation. Of the total of 43 cases 6 were fatal, indicating a mortality rate of 14 per cent. Death occurs between the fifth and seventh day after exposure. Recovery occurs within seven to eleven days.

Journal of International College of Surgeons, Chicago

7: 257-336 (July-Aug.) 1944

- Blast.* H. Bailey.—p. 257.
- Administrative Procedures in Handling of Discharge of Disabled Service Men.* L. Sanders.—p. 263.
- Classification of War Wounds.* B. Hughes.—p. 275.
- Use of Plasma Whole Blood and Human Serum Albumin by Armed Forces.* D. B. Kendrick Jr.—p. 289.
- Gas Casualties.* A. H. Waitt.—p. 296.
- Anesthesia During Circumstances of War.* E. A. Rovenstine.—p. 301.
- Total Rupture of Posterior and Inferior Aspects of Bladder: Rectovaginal Fistula.* A. J. Pavlovsky.—p. 308.
- Free Muscle Transplantation in Restoration of Lips and Cheeks.* A. Prudente.—p. 312.
- Plasma, Whole Blood and Human Serum Albumin.**—Kendrick states that recent developments in the field of replacement fluids have not removed the necessity for whole blood transfusions. Whereas plasma and albumin are effective therapeutic agents in shock and burns, whole blood is still indicated in severe hemorrhage, secondary anemia from burns, infections, carbon monoxide poisoning and many medical diseases. Fresh whole blood and stored blood are used. In order to make fresh blood available in the "theater of operations," the distilled water bottle from the Standard Army-Navy Plasma Package will be salvaged and utilized. It may be necessary to have stored whole blood on hand for immediate use. Equipment will be provided in large fixed medical installations where whole

blood can be collected under a "closed system" and stored in refrigerated boxes for a period of five to seven days. It is expected that most of the blood collected for storage will be taken from proved group O donors, thus making it possible to inject this blood into recipients of all types.

Free Muscle Transplantation.—Prudente's method consists in the transplantation of a piece of muscle completely separated from its muscular body and transported through a skin tube. The sternocleidomastoid and pectoralis major are the muscles of choice for the face. This operation has been used in 4 cases. Three cases involved defects of the angle of the mouth and the cheek, 1 resulting from noma and 2 from cancer. The fourth was a case of cancer of the floor of the mouth involving the jaw and the inferior lip. Two cases of the first group have already been reconstructed both anatomically and functionally. The other 2 are in the last stages of restoration. The author stresses the following points: 1. Healing of the muscular skin flap is always by first intention, because the union is made between tissues of the same nature. 2. After the first stage, when the muscle strip is isolated before its transplantation, it is transformed into a fibrous tissue, but after that transplantation, when it lies close to the healthy muscles of the new region, it recovers its normal aspect, corresponding to a true rehabilitation of the tissue. 3. After a few months the grafted muscle recovers its function, probably as the result of nervous penetration from neighboring muscles, and the patient is able to perform every movement. Whistling and spitting are possible with real contraction of the grafted muscle. 4. Microscopic examination of the grafted muscle shows that its structure is perfectly normal.

Journal-Lancet, Minneapolis

64: 253-290 (Aug.) 1944

Suggested Therapeutic Procedure for Treatment of Emphysema by Closed Method: Preliminary Report. E. E. Carpenter.—p. 278.

Counterirritation. A. C. Moorhead.—p. 280.

64: 291-324 (Sept.) 1944

Address of the President. J. C. Ohlmacher.—p. 302.

Address of President-Elect. D. S. Baughman.—p. 310.

Students' Health Service Experience in Outpatient Care of Army Students. M. M. Weaver and R. G. Hinkley.—p. 311.

Differential Diagnosis of Acute Glaucoma. F. N. Knapp.—p. 315.

Journal of Neurosurgery, Springfield, Ill.

1: 299-364 (Sept.) 1944

- Basilar Impression (Platybasia) Case Secondary to Advanced Paget's Disease with Severe Neurologic Manifestations: Successful Surgical Result.* H. T. Wycis.—p. 299.
- Histologic Studies of Brain Following Head Trauma: IV. Late Changes; Atrophic Sclerosis of White Matter.* J. P. Evans and I. M. Scheinker.—p. 306.
- Extradural Cerebellar Hematoma: Case Report.* F. Turnbull.—p. 321.
- Bilateral Nerve Deafness, Persistent Cough and Paroxysmal Hyperpnea Due to Tumor in Floor of Fourth Ventricle.* D. Weller.—p. 325.
- Tantalum Cranial Clip.* W. B. Hamby.—p. 331.
- Operative Results in Intervertebral Disks.* F. C. Grant.—p. 332.

Operative Results in Intervertebral Disks.—Grant reviews observations on 150 patients with ruptured intervertebral disks verified at operation. All of these patients had at least a six months follow-up period. Before operation 11 patients were bedridden, 27 were unable to do gainful work and 112 were working with disabilities. Of the 11 bedridden patients, 6 are back at their previous jobs, 3 are employed in less arduous labor and 2 are unable to work. Among the 27 unable to work preoperatively 17 are back at work, 6 are improved and 4 are unimproved. Of the 112 patients working with disability, 55 are cured, 47 are improved and 10 not improved following surgical intervention. The author also reviews the results of conservative treatment of 93 patients with an assured diagnosis of ruptured disk. Of 15 bedridden patients 9 have completely recovered and 3 have improved enough to carry on light work. Of 42 who were unable to work, 36 have recovered sufficiently to return to less arduous work; the other 6 are still not working. Thirty-six who were working with disabilities are still at work, although 24 of them have had to change their employment. On the basis of this assessment the author sees no reason to change the conservative attitude he has adopted in the past two years. Surgery is not, in his opinion,

the only treatment for this condition. Many of these patients will recover with rest, leg traction, back support and other nonoperative means. If this is unsuccessful, or if a recurrence of pain is noted, surgery should be considered.

Michigan State Medical Society Journal, Lansing

43: 625-720 (Aug.) 1944

- War Casualties in General Hospital in U. S. A. R. H. Kennedy.—p. 657.
Malaria: Current and Postwar Medical Problem. L. T. Coggeshall.—p. 662.
Intussusception. L. J. Gariepy and R. M. Atchison.—p. 665.
Peculiarities in Physiology of Newborn Patients. C. A. Smith.—p. 668.
Poliomyelitis: Contrast Between Kenny and Orthodox Concepts with Results of Treatment. Elizabeth Kenny.—p. 673.

43: 721-840 (Sept.) 1944

- Health Needs of Nation as Reflected by Selective Service. L. G. Rowntree.—p. 769.
Neglected Interns. L. R. Leader.—p. 777.
Analysis of Deaths Occurring in Michigan from Pneumonia (All Forms). A. B. Mitchell.—p. 779.

New England Journal of Medicine, Boston

231:279-314 (Aug. 24) 1944

- *Pain and Disability of Shoulder and Arm Due to Herniation of Nucleus Pulposus of Cervical Intervertebral Disks. J. J. Michelsen and W. J. Mixer.—p. 279.
Serologic Types of Hemolytic Streptococci Isolated from Scarlet Fever in Massachusetts, 1942-1943. S. M. Wheeler and G. E. Foley.—p. 287.
Polyarthritis in Sickle Cell Anemia. H. G. Brugsch and Dorothy Gill.—p. 291.
Recent Advances in Surgery (concluded). A. Blalock.—p. 293.

Disability of Shoulder and Arm Due to Herniation of Nucleus Pulposus.—Michelsen and Mixer report observations on 8 cases of herniation of the nucleus pulposus in the lower cervical spine. There were lesions at the fifth cervical interspace in 4 cases, at the sixth in 3 and at the seventh in 1, with involvement of the sixth, seventh and eighth cervical roots, respectively. The clinical data were brought together in a syndrome that comprised root pain and local sensory and motor disturbances, as well as positive x-ray, cerebrospinal fluid and iodized oil findings. The distribution of the sensory abnormalities was compared with standard dermatome charts. In these cases the sixth cervical dermatome seemed to involve the scapula, the anterolateral aspect of the upper arm, the antecubital space, the radial forearm and its thumb and index finger. The seventh cervical dermatome seemed to involve the scapula, the posterolateral aspect of the upper arm and the dorsal surface of the forearm and the index and middle fingers. The eighth cervical dermatome seemed to involve the scapula, the inner and upper arm, the forearm and the little finger. The importance of a systematic neurologic examination in cases of pain or disability of shoulder and arm is emphasized in order to separate the apparently specific syndrome of cervical herniations of the nucleus pulposus from other extraspinal and intraspinal entities. All of the 8 reviewed cases were proved by operation. All the patients had various forms of treatment prior to their hospital admission, without permanent relief. Such measures comprised baking and massage, lamp treatments, strapings and head traction. One patient was injected locally with procaine hydrochloride. The laminectomy and removal of the disk fragment produced good results in 6 cases. In 1 case the improvement was not too impressive. In 1 case in which the disk fragment could not be removed for technical reasons the pain was relieved but the motor disability persisted.

231: 315-342 (Aug. 31) 1944

- *Chronic Latent Hepatitis Following Catarrhal Jaundice. M. D. Altschule and D. R. Gilligan.—p. 315.
Dislocation of Knee Joint: Report of 2 Cases. J. W. Sever.—p. 318.
Boston Medical Library. D. Cheever.—p. 320.
Late Effects of Total and Subtotal Gastrectomy. F. J. Ingelfinger.—p. 321.
New Hampshire Medical Society: Proceedings of the One Hundred and Fifty-Third Anniversary, House of Delegates, May 15 and 16, 1944.—p. 327.

Chronic Latent Hepatitis Following Catarrhal Jaundice.—Altschule and Gilligan state that there are now available in the literature records of the persistence of icterus as well as reports describing increased plasma bilirubin and decreased bilirubin excretory function in some patients who years previously had had an attack of catarrhal jaundice. Chronic gastrointes-

tinal complaints and chronic hepatic enlargement have also been reported as sequelae of acute catarrhal jaundice. The present report of laboratory and clinical studies made in an unselected series of 36 persons who had had catarrhal jaundice one to twenty-nine years previously similarly demonstrates in some cases the persistence for years of certain evidences of hepatic dysfunction. Hyperbilirubinemia was detected in 9 of the 36 patients. It is probable that the incidence of impairment of liver function was even higher, since the distribution of plasma bilirubin values revealed an abnormally large number in the high normal range. Nine subjects in the entire group had palpable livers and 1 a palpable spleen. The chronic latent liver disorder revealed by this study was not accompanied by symptoms and did not appear to be progressive. It is concluded that a mild, benign form of chronic hepatitis is frequent after catarrhal jaundice.

North Carolina Medical Journal, Winston-Salem

5: 265-312 (July) 1944

- Psychiatry Today. K. E. Appel.—p. 265.
Treatment of Kidney Disease and Hypertensive Vascular Disease with Rice Diet: II. W. Kempner.—p. 273.
Changing Phases in Treatment of Tuberculosis. P. H. Ringer.—p. 274.
Child Guidance: Responsibility of Every Physician. M. J. Carson.—p. 277.
The 1915 Serbian Typhus Epidemic. W. C. Davison.—p. 282.
Diagnosis of Eye Conditions Frequently Seen in General Practice. G. B. Sharbaugh.—p. 285.

5: 313-412 (Aug.) 1944

- President's Message: Some Further Considerations Relative to Extension of Medical Care in North Carolina. P. F. Whitaker.—p. 313.
Benjamin Waterhouse (1754-1846) and Introduction of Vaccination into America. J. C. Trent.—p. 317.

Review of Gastroenterology, New York

11:223-290 (July-Aug.) 1944

- Chronic Gastritis. F. Cunha.—p. 239.
Gastrointestinal Symptoms in Relation to Hypertension and Renal Disease. B. Jablons.—p. 246.
Management of Ulcer Syndrome. B. M. Bernstein.—p. 254.
Celiac Syndrome. B. Kramer.—p. 256.
Inflammable Physiologic Gases in Rectum and Colon, with Report of Case. W. Lieberman.—p. 259.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

52: 359-406 (Sept.) 1944

- Protection for Industrial Women: Progress and Prospects. Mary Anderson.—p. 359.
Why Do Women Stay Away from Work? Preliminary Report. C. O. Sappington.—p. 363.
Practical Industrial Health for Women. F. B. Wishard.—p. 368.
Report of Committee on Health of Women in Industry: Section on Obstetrics and Gynecology of American Medical Association. H. C. Hesselstein and others.—p. 372.
*Use of Methergine (Synthetic Ergonovine) in Third Stage of Labor: Preliminary Report. P. C. Roberts.—p. 380.
Methergine (Synthetic Lysergic Acid Derivative) a New Oxytocic: Preliminary Report. D. G. Tollefson.—p. 383.
Treatment of Chronic Arthritis. J. A. Key.—p. 385.

Methergine (Synthetic Ergonovine) in Third Stage of Labor.—Roberts reports observations on a new synthetic ergonovine which is known as methergine. This substance, which was synthesized by Stoll and Hofmann of Basel, Switzerland, is particularly important because of the potential shortage of rich ergot of rye. Methergine was first employed subcutaneously in 26 cases which were observed in the Department of Obstetrics of Stanford University Hospital. No systemic reactions were encountered in any of these cases. Methergine was then administered intravenously in the third stage, in doses of 1 cc. containing 0.2 mg., to 34 patients, of whom 6 were primiparas and 28 multiparas. The contraction of the fundus following methergine was stronger and of considerably greater intensity and duration than with the usual ergonovine preparations. No increase in the incidence of postpartum morbidity or subinvolution of the uterus was noted in this series. Experience with methergine has convinced the author that it is a useful, potent oxytocic of great value. Of particular interest has been the reduction of blood loss in the third stage of labor—not necessarily the lowering of the level within normal limits, but rather the elimination of those cases of severe hemorrhage of over 500 cc. In view of the small series, the results with methergine require further verification.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

25: 27-80 (April) 1944. Partial Index

- Observations on Bactericidal and Bacteriostatic Actions of P-Aminobenzenesulfonamide and P-Hydroxylaminobenzenesulfonamide, with Special Reference to Their Suppression by P-Aminobenzoic Acid. J. W. McLeod, Anna Mayr-Harting and N. Walker.—p. 27.
- Effect of Cell Growth Promoting Tissue Extracts on Healing of Experimental Cutaneous Wounds in Rats: I. Local Application. E. Auerbach and L. Doljanski.—p. 38.
- Effects of South Wales Anthracite Coal and of Precipitated Amorphous Silica on Lungs of Mice. J. A. Campbell.—p. 46.
- Experiments on Inhibitor Occurring in Rous No. 1 Sarcomas. J. G. Carr.—p. 56.
- Action of Sulfonamides Against Treponema Recurrentis. F. Hawking.—p. 63.

British Medical Journal, London

2: 169-200 (Aug. 5) 1944

- Penicillin: Survey. H. W. Florey.—p. 169.
- *Treatment of Acute Empyema with Penicillin. E. C. B. Butler, K. M. A. Perry and F. C. O. Valentine.—p. 171.
- Penicillin in Ophthalmology. J. G. Milner.—p. 175.
- Penicillin and Sulfonamides in Infantile Gastroenteritis. Elizabeth Burns and W. Gunn.—p. 178.
- Severe Hemolytic Transfusion Reaction Due to Rh Factor. A. Beck, C. V. Harrison and J. M. Owen.—p. 180.

Penicillin in Treatment of Acute Empyema.—Butler and his associates dissolved penicillin in water to give a concentration of 1,000 units per cubic centimeter, and the dosage was adjusted to the size of the cavity. The sensitivity of the infecting organism having been established, the initial injection varied between 10,000 and 40,000 units, 20,000 being usual. As treatment proceeded, 10,000 or 5,000 units often sufficed. The authors treated 18 cases. Seventeen of these were infected. In 10 the invading organism was the streptococcus and in 7 the pneumococcus. In 1 patient with sterile traumatic hemothorax, treatment with penicillin prevented infection. The infected cases treated with penicillin show that, provided the infecting organism is susceptible, an empyema cavity can be sterilized by repeated aspiration of the pus and injection of penicillin and the toxic condition is thereby relieved. It is too early to assess the final results of the treatment, since further improvement is expected in some cases, while symptoms may yet develop in others arising from pulmonary fibrosis. The period required for final sterilization is unpredictable, since some cases showed recurrence after eight to ten days of continuous treatment, whereas some remained sterile after only five days' treatment. After sterilization there was the tendency for sterile pus to be formed in which minute gram positive cocci persisted. It seems possible that these organisms, although dead, may remain pyogenic. The source of these organisms and of normal cocci in cases of recurrence is probably to be found in the masses of fibrinous exudate lining the walls of the cavity, the removal of which might be expected to hasten sterilization and limit the formation of pus. To accomplish the removal of this exudate some recommend irrigation of the cavity with sterile saline solution before injecting penicillin, while others advise rib resection and removal of the fibrinous masses lining the cavity as soon as the infection is under control and the patient fit for the operation. There is little hope of avoiding a thickened pleura and rigid chest wall without removal of the fibrinous masses.

2: 201-232 (Aug. 12) 1944

- Nutritional Status of Cambridge School Children. J. Yudkin.—p. 201.
- Nutrition and Scholastic Attainment. I. F. MacKenzie.—p. 205.
- Koilonychia and Its Recovery in Cases of Thyrotoxicosis. Lorna Cooke and Stella M. Luty.—p. 207.
- Histologic Effect of Injection of Mepacrine (Atabrine) Dihydrochloride. F. Hawking.—p. 209.
- Sterilization of Skin by Colorless Flavine (5-Amino-Acridine). V. Bonney and H. S. Allen.—p. 210.
- *Pituitary Cachexia Treated with Corticotrophic Hormone. R. E. Hemphill and M. Reiss.—p. 211.

Pituitary Cachexia Treated with Corticotrophic Hormone.—Hemphill and Reiss describe the case of a woman whose menses ceased abruptly at the age of 39 without subjective menopausal disturbances. She became depressed, lost

appetite and imagined that her viscera were deranged and the bowels "stopped up"; she attempted suicide. She was thin, weak, and frail looking. The skin was extremely dry. The hair of the head was brittle and lusterless, that of the pubis and axillae scanty; muscle bulk was reduced. There was no assayable output of gonadotropic, corticotropic or thyrotropic hormones in the total urine of ninety-six hours; the output of 17-ketosteroids was only 2.6 mg. in twenty-four hours. Forty sudanophobic units of corticotropic units were administered daily for twenty-four days. There was immediate improvement. Two months later a further course of daily injections of 25 units was given for fourteen days. This treatment resulted in complete restoration of weight and cosmetic features. This was not a case of anorexia nervosa. The psychotic depression was not relieved until a considerable time after physical improvement was complete. It is now two years since hormone treatment has been given, but the improvement has been maintained.

Edinburgh Medical Journal

51: 209-256 (May) 1944

- Controversy on Contagiousness versus Noncontagiousness of Leprosy, with Particular Reference to Dr. W. Munro's Contributions Published in Edinburgh Medical Journal. E. D. W. Greig.—p. 209.
- Some Problems of Communal Feeding. C. P. Stewart.—p. 215.
- Abdominal Pain in Pregnancy. E. C. Fahmy.—p. 229.
- Biochemical Classification of Coliform Bacilli in Sputum. R. Salm.—p. 247.

51: 257-304 (June) 1944

- War Wounds of Abdomen: Report of 64 Cases Treated by Laparotomy. A. G. R. Lowdon.—p. 257.
- *Propylene Glycol Vapor as Air Disinfectant: I. S. W. Challinor and J. P. Duguid.—p. 280.
- Experimental Cancer Research. J. F. Riley.—p. 290.

Propylene Glycol Vapor as Air Disinfectant.—Challinor and Duguid investigated the efficiency of propylene glycol vapor as an air disinfectant (a) in air continuously infected by atomization of suspensions of *Bacillus prodigiosus* and (b) in a crowded room with its natural, largely dust borne, air infection. The effect of single vaporizations of the glycol was found to be transient. Reduction of air infection could be maintained by continuous vaporization of the glycol or by single vaporizations repeated at short intervals of about ten minutes. Vaporization at the rate of 1 cc. of glycol per million cubic centimeters of air per hour produced a considerable reduction (about 85 per cent) in the naturally present air infection of a crowded room during the period of vaporization; perceptible mist formation, which might be found objectionable in practice, occurred at this dosage rate. Vaporization at lower rates did not result in mist formation but produced only small reductions in the air infection.

Lancet, London

2: 197-230 (Aug. 12) 1944

- Major Complications of Penetrating Wounds of Chest. A. L. D'Abreu, J. W. Litchfield and C. J. Hodson.—p. 197.
- Primary Tuberculous Infection in Nurses: Manifestations and Prognosis. M. Daniels.—p. 201.
- Processing of Plasma with Kaolin. M. Maizels.—p. 205.
- Crush Kidney Syndrome in Cat. M. Grace Eggleton.—p. 208.
- *Treatment of Typhus with Anti-Typhus Horse Serum. M. Wolman.—p. 210.

Treatment of Typhus with Anti-Typhus Horse Serum.—According to Wolman typhus in Addis Ababa is louse borne. Epidemiologic, immunologic and clinical studies have shown that it is epidemic typhus, identical with the European disease. The mortality varies from year to year and from month to month. The observations reported in this paper extended over a period of eighteen months and covered two major epidemics. The patients were mostly Ethiopians. All patients admitted with symptoms of typhus were given a special chart with a serial number. Venous blood, taken on the day the provisional diagnosis was made, was sent to the Medical Services Laboratory for Weil-Felix and Weigl tests. Patients with even numbers were given symptomatic treatment only. Patients with uneven numbers were given the same symptomatic treatment, plus serum. The total number of patients was 440. For the

preparation of the serum the Ethiopian army lent 2 horses. Living rickettsias contained in the intestines of lice, prepared for Weigl vaccine, were injected into the horses, usually every five to six days, in doses increasing over a period of two and one-half months. The horses were then bled twice (five and ten days after the last injection). In each subsequent month a further series of injections was given (ordinarily 250, 375 and 500 louse intestines) followed by two further bleedings. The blood was collected in large sterile bottles one-tenth full of 5 per cent sodium citrate, and after two or three days the supernatant serum was siphoned off and enclosed in rubber capped bottles, with merthiolate or phenol as a preservative. The dosage of serum was 20 cc. subcutaneously twice on the first day and once on three succeeding days. The mortality of the treated group was 3.6 per cent, compared with 10.9 per cent in the controls. The serum seemed to shorten the illness and reduce the incidence of psychotic symptoms. Its influence was greater when given early in the illness.

Medical Journal of Australia, Sydney

2: 49-76 (July 15) 1944

- *March Hemoglobinuria: Description of Features of This Condition and Report of Case. Lucy M. Bryce.—p. 49.
Some Observations on Tuberculosis Control. H. Roche.—p. 52.
Experiment on Complete Transformation of Scrotum into Marsupial Pouch in *Trichosurus Vulpecula*. A. Bolliger.—p. 56.

2:77-100 (July 22) 1944

- Sporadic Occurrence of Influenza in Victoria During 1943. W. I. B. Beveridge and S. E. Williams.—p. 77.
Modern Management of Prostatic Obstruction. R. J. Silverton.—p. 80.
Precipitin, Agglutination, Indole and Methyl Red Reaction of Dysentery Bacilli. F. Draper.—p. 84.

March Hemoglobinuria.—This is a condition in which physical exertion, usually in the form of marching, is followed by the passage of red or dark colored urine. The author lists the following salient features of march hemoglobinuria: 1. It occurs in young males, usually in the second or third decade. 2. It is related to exercise in the upright position. 3. Constitutional symptoms are absent or mild. 4. The course is benign. The condition appears to have no permanent ill effects, and it progresses without specific treatment toward ultimate spontaneous recovery, which usually takes place within a period of months or a year or two after the initial attack. Occasionally it is of longer duration. In 1 case periodic attacks occurred for seven years, and in another case attacks occurred intermittently for twenty years. The essential nature of the condition—that is, its relation to exercise in the upright position and the absence of associated physical abnormalities or after-effects, may tend to cause delay in diagnosis. This occurred in the case reported. A corporal who enlisted in the Australian Military Forces at the age of 18 noticed that his urine was "dark" after more than usually strenuous military training exercises, but as he felt otherwise quite well, and as the condition did not persist, he did not report this attack at the time. Several months later another attack occurred, associated this time with some pain in the groins. Eight hours later he reported at the hospital. No abnormalities were detected on physical examination. Three days after his return to camp another attack occurred in which the passage of "dark" urine was associated with pain in the right loin. He was admitted to the hospital, but again no abnormalities could be detected. At several successive hospitalizations numerous tests were made, and finally it was discovered that a march of forty-five minutes' duration was followed by hemoglobinuria. The author points out that the usual program of investigations designed to demonstrate or exclude the more common causes of hematuria or the presence of abnormal pigments in the urine is almost certain to be carried out with the patient at rest. By virtue of this fact a sojourn in a hospital for investigation will actually tend to prevent the occurrence of march hemoglobinuria and so fail to reveal the symptoms of which the patient complains. Unless, therefore, the possibility of march hemoglobinuria, which at least in its severe forms is rare, is kept in mind, considerable difficulty and delay may occur in confirming the patient's statements and establishing the diagnosis.

Revista Chilena de Pediatría, Santiago

15:249-323 (April) 1944. Partial Index

- Medical and Social Problem of Asphyxia of the Newborn. E. Cienfuegos.—p. 249.
*Neurologic Complications of Typhoid. B. Bambach and P. Guerrero.—p. 278.
Trichinosis in Children. F. Martinez L. de G.—p. 297.
Pulmonary Atelectasis in Children and Its Relation to Primary Tuberculosis.—p. 316.

Neurologic Complications of Typhoid.—Bambach and Guerrero present the histories of 2 children with typhoid who had neuropsychic complications that masked the course of the typhoid. The first child, aged 5, had hemiparesis of the right side, which was probably of central origin. The process was most severe in the lower extremity, and since there was no involvement of the tongue it is assumed that the lesion was located in the upper part of the left Rolandic convolution. The neurologic symptoms completely disappeared; a neurologic examination made fifty-eight days after hospitalization was negative. The diagnosis of typhoid was amply corroborated by a positive Widal reaction and a typical blood picture. The second case concerned a child aged 6 who was hospitalized with an undetermined infectious disease. The symptomatology indicated involvement of the nervous system, but the case remained undiagnosed for a long time. Finally blood culture yielded Eberth's bacillus, and a 1:100 positive Widal reaction was obtained. The authors reviewed 100 cases of typhoid that were observed at their hospital during recent years. Excepting cases with only dulling of the sensorium, there were 15 with neurologic signs. This contrasts with only 1.73 per cent of neurologic involvement in an epidemic in Lyon in 1928-1929 and with only 4 per cent reported from Uruguay. The authors think that this diversity of percentages speaks for differences in the type of epidemic or for regional peculiarities. In the cases reviewed by them the mortality of the cases with neurologic involvement was 23 per cent. The cases which do not have a fatal outcome are usually reversible and have no sequelae.

Münchener medizinische Wochenschrift, Munich

89:923-946 (Oct. 30) 1942. Partial Index

- *Differential Diagnosis of Icterus Catarrhalis and of Hepatitis Epidemica: 1. Varieties of So-Called Icterus Catarrhalis. R. Mancke and W. Siede.—p. 923.
Lead Poisoning from Drinking Water, Its Clinical Importance, Public Health Aspects and Prophylaxis. W. Kollath.—p. 927.
Etiology and New Causal Lipoid Therapy of Neuroses. R. Bleibrunner.—p. 931.
Problem of Combined Treatment with Strophanthin and Glucose. H. Lachmann.—p. 935.

Differential Diagnosis of Catarrhal Jaundice and of Epidemic Hepatitis.—Mancke and Siede report their observations in 456 cases of so-called icterus catarrhalis. Three groups are differentiated: 1. The specific icterus catarrhalis, which starts with intestinal symptoms, frequently without any rise of temperature. Alimentary or endogenous intestinal toxins may reach the liver cells by the portal vein or by the intestinal lymph radicles. It is characterized by its deleterious effect on the membrane. Toxic edema of the liver, serous hepatitis combined with destruction of liver cells, may be the result ("forme fruste" of the acute and subacute atrophy of the liver). 2. Capillary cholangitis, which may develop by ascending from the large bile ducts or which may be of hematogenous origin; in the latter case one may have to deal with a cholangitis of excretory type. The injurious agent is bacterial in the majority of these cases. A lesion in the area of the "intermediary portion" of the bile ducts may occur first. The bile ducts are lined with epithelium and are connected with the intercellular bile capillaries of the liver; "intermediary portion" is the term used for this first portion of the bile ducts. It deserves special morphologic consideration as a particularly vulnerable area of the bile ducts. An icterus of fine mechanical origin from obstruction in the area which contains the sources of bile may result from the lesions in the aforementioned area. 3. The specific hepatitis. Direct destruction of liver cells may be caused by a hematogenous toxin of liver cells whose chemical structure may be more or less ascertained. Arsphenamine, cinchophen, chloroform and phosphorus may be mentioned. Fatal hepatargy may result from toxic hepatitis induced by mushroom poisoning.

Book Notices

The Chemistry and Technology of Food and Food Products. Prepared by a Group of Specialists Under the Editorship of Morris B. Jacobs, Ph.D., Senior Chemist, Department of Health, City of New York. Volume I. Cloth. Price, \$10.50; \$19 per set of 2 volumes. Pp. 952, with 79 illustrations. New York: Interscience Publishers, Inc., 1944.

This is the first of two volumes devoted primarily to a complete description of the technical aspects of foods, their sources, composition, processing and also the related body physiology. Each chapter has been prepared by a specialist in the field; altogether forty-one individuals collaborated in the work, with the whole edited by one well versed in the broad subject of food control. Two of the six sections of this treatise on foods comprise volume I. The first deals with fundamental food chemistry and body processes related to foods. The chemical discussion of the basic food constituents is extensive and well done. The physiologic coverage is less complete, but this subject may be considered of secondary interest in this book. Use of the term "vitagen," referring to the so-called essential fractions of the basic food constituents, is of dubious value. The brief mention of disease conditions resulting from lack of food substances is incomplete. For example, iodized salt is not included as a food source of iodine, the preventive of simple goiter.

The second section of this volume presents widely diversified information on every basic type of processed and unprocessed foodstuff, as well as beverages and condiments. For each class a historical sketch is given followed by information on growth and production, varieties available, chemical composition, methods of preservation, government controls and standards of identity, as well as other facts of interest. The numerous tables offer valuable sources of reference data, although some of the data so supplied are not the most recently available and in some instances the vitamin values are given in units now considered obsolete. The presentation is strictly scientific throughout, with support of frequent references to the literature and inclusion of a bibliography at the end of each chapter. This volume is a combination of textbook on food chemistry and encyclopedia of basic food information. It represents an ambitious undertaking which has gathered together a great deal of information, heretofore unrelated, for the benefit of science and industry.

Lippincott's Quick Reference Book for Medicine and Surgery: A Clinical, Diagnostic and Therapeutic Digest of General Medicine, Surgery, and the Specialties, Compiled Systematically from Modern Literature. By George E. Reiberger, A.B., M.D. Twelfth edition. Fabrikoid. Price, \$15. Pp. 1,460, with 305 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

In this edition the sections on gynecology and genitourinary diseases have been entirely rewritten, and the list of drugs has been revised in accordance with the new Pharmacopeia and National Formulary. The publisher points out that the advances in medicine have been so great that scarcely a page of the book has gone unchanged. Special attention is called, however, to new material on chemotherapy, shock treatment, burns, deficiency diseases and nutrition. Many new color plates have been added to the present edition of this well known encyclopedia.

Health Counseling for Girls. By Margaret L. Leonard, Ed.D. With a foreword by Ruth Strang, Ph.D. Cloth. Price, \$1.50. Pp. 131. New York: A. S. Barnes & Company, 1944.

This is a valuable book for any one who has to interview girls in connection with physical education, health education or administrative work (advisers and deans) and for personnel directors in industries employing many women. The book is devoted to an exposition of techniques. It starts with a chapter in which are summarized interviews with eight girls presenting different health and personal problems. These interviews are analyzed in terms of approach, interview techniques, the use of records and suggested ways of asking questions. The author concludes that, allowing for emotional disturbance, shyness, suspicion and the like, adolescents, for the most part, appear to try sincerely to give honest answers to questions. The second chapter deals with health counseling as part of a total school program. This includes much valuable information as to the

role of the counselor and how it can best be discharged. Chapter III deals with specific health counseling problems, such as loss of weight, absence due to abdominal pain and nausea, return to regular physical education after illness, dental care problems, deafness, health in relation to selecting a college and the lighter school program after a month's absence due to pneumonia, nail biting, cardiac patients and stair climbing, skin disorders and so on. Extreme overweight or underweight, menstrual problems, fatigue, posture, faulty elimination, personal fastidiousness, difficulties with school work, boy and girl relationships and getting along with other girls are other topics dealt with. Chapter IV deals with the interrelationship of counseling and group activities among adolescents. In these four brief chapters the topics are dealt with effectively, clearly and briefly but not dogmatically. This should be an excellent reference and handbook for the purposes suggested in its title.

The Blood Plasma Program. By James A. Phalen, M.D., Colonel, U. S. Army. Issued by the Office of Medical Information (Under Grant of the Johnson & Johnson Research Foundation). National Research Council, Division of Medical Sciences. Paper. Pp. 67. Washington, D. C., 1944.

Spontaneous Pneumothorax. By James J. Waring, M.D. Issued by the Office of Medical Information (Under Grant of the Johnson & Johnson Research Foundation). National Research Council, Division of Medical Sciences. Paper. Pp. 34, with 2 illustrations. Washington, D. C., 1944.

Antimalarial Drugs: General Outline. By Owsel Temkin, M.D., and Elizabeth M. Ramsey, M.D. Issued by the Office of Medical Information (Under Grants of the Carnegie Corporation and the Johnson & Johnson Research Foundation). National Research Council, Division of Medical Sciences. Paper. Pp. 128, with illustrations. Washington, D. C., 1944.

These three mimeographed pamphlets, all issued by the Office of Medical Information of the National Research Council, are brief informative monographs on timely subjects. Of the three under review, the one on "Antimalarial Drugs" is the most extensive, since it includes a bibliography of 237 titles. The publication of these brochures has been made possible by grants from the Johnson and Johnson Research Foundation, and in the case of the publication on "Antimalarial Drugs," with the help of the Carnegie Corporation as well. All three publications are useful and authoritative within the limits of the space employed.

Sex Education in Schools and Youth Organisations. Board of Educational Pamphlet No. 119. Paper. Price, 15 cents; 6d. Pp. 22. New York: British Information Services; London: His Majesty's Stationery Office, 1943.

In Britain, as in the United States, sex education is approached gingerly, with many misgivings, false starts, a furtive rather than forthright approach. Every one agrees that it should be done and every one gives a sigh of relief when some one else shows signs of doing it. Lectures, conferences, pamphlets and books have all been tried in Britain, as they have in the United States, and it all comes down to the fundamental question of who is doing the teaching. Given a teacher of appropriate personal qualifications, all goes well; lacking such a teacher, no system and no literature has any effectiveness or validity. In Britain, as in the United States, "it is the general view that sex instruction should be given as a related part of a wider course, especially biology, so that sex and reproduction may be introduced in their proper places without undue emphasis. Many schools, however, are without biology teaching and in others the biology staff are not anxious to give the instruction. In these cases special classes are often necessary." This could have been written with equal validity about the American situation, as could this: "Invariably parents are relieved to know that the question has been discussed but get foolishly hot and bothered if their wishes are consulted beforehand."

The Medical Annual: A Year Book of Treatment and Practitioner's Index. Sir Henry Tidy, K.B.E., M.A., M.D., and A. Rendle Short, M.D., B.S., B.Sc., Editors. Sixty-Second Year 1944. Cloth. Price, \$7. Pp. 404, with illustrations. Baltimore: Williams & Wilkins Company, 1944.

This yearbook continues through the war years and constitutes essentially a collection of abstracts largely from British and American publications. There are occasional rare references to the literature of central Europe, and these are mostly in relation to subjects concerned in the war.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ADOPTION FROM FAMILIES OF POOR STOCK

To the Editor:—About two months ago I delivered a set of twins in the home. They weighed 6 and 6½ pounds (2,725 and 2,955 Gm.), and were the eighth and ninth babies of this mother. At about 1 month of age they were dehydrated and weighed about 4 pounds (1,815 Gm.) each, and since they were not well cared for by the mother they were entered in the hospital. The babies are back to normal now, and the mother wants some one to adopt them. One of my best friends has asked my advice about adopting them; how to answer him is my problem. The father of the children is in the penitentiary for stealing; the oldest son is in the county jail for the same offense. The mother is ignorant. The other children look and act well. The family is at the lowest economic level. What are the chances for these babies to inherit the traits of their father and brother?

M.D., Alabama.

ANSWER.—While the general opinion is that children do not inherit acquired characteristics, in selecting a child for adoption the average foster parent should feel that the stock of the baby is at least average in order that he may get an even break in setting the environment for the child he takes into his household. It would be decidedly questionable to adopt children with the type of family history given in this case. It is quite evident that they come from less than average stock. The only thing which would change this opinion would be some additional information about the ancestry of this family which might be more favorable.

FEVER OF UNKNOWN ORIGIN

To the Editor:—A man aged 39 was admitted to the hospital because of nine days of remittent high fever of 105 to 99 F. daily, which did not respond to sulfonamides. The patient had had an occasional nonproductive cough and at the start of his illness had had a transient charleyhorse in his right leg, which had not annoyed him since. There were no other symptoms. The patient had not traveled outside of New York City, and there was no known contact with illness. The past history was entirely normal. On admission the patient appeared acutely ill and was shivering. Physical examination was entirely normal. The urine was normal. The blood count showed 11,000 white cells with 74 per cent polymorphonuclear cells, 4 per cent monocytes and 22 per cent lymphocytes. Of twelve blood cultures, nine were sterile and three showed *Streptococcus viridans*. On one occasion blood agglutinations showed typhoid positive 1:80, paratyphoid A and B each positive 1:160. A smear for malaria was negative. The temperature curve by days was 105, 98.6, 102, 98.6, 100 F. and normal thereafter. Spinal fluid examination was normal, as was an electrocardiogram and a chest plate. The stools showed no ova or parasites. What significance is attributable to the repeatedly positive culture for *Streptococcus viridans* in the absence of any other evidence for bacterial endocarditis? What type of treatment and follow-up are indicated? Can you suggest a diagnosis?

M.D., New York.

ANSWER.—Cases like the one described in which diagnosis cannot be made are not uncommon. It must be expected that not every case can be diagnosed. There are, no doubt, still some infections whose cause is unknown, and in other instances well known infections may occur without telltale evidence by which diagnosis may be made.

Data given in the case in question are incomplete. At what season of the year did it occur? What was the sedimentation rate of the erythrocytes? What was the nature of the "charleyhorse"? Charleyhorse in Gould's Medical Dictionary is described as "a rupture or strain of muscle or tendon fibers generally resulting from athletic efforts." If the patient had this condition, the local injury and hemorrhage into the tissue, myositis, phlebitis or cellulitis may have served as the source of the trouble, which could begin with a chill, last nine days with remittent fever and not be influenced by sulfonamide therapy. On the other hand, the charleyhorse may have been mistaken for a small embolus, phlebitis or other condition.

The significance of *Streptococcus viridans* in the blood on several occasions is uncertain. This ubiquitous coccus may appear transiently and apparently harmlessly in the blood stream in many febrile diseases, and its presence has caused confusion in mistaking it for the cause rather than as a commensal. On the other hand, the attack described may be the first evidence of subacute bacterial endocarditis. If the patient remains well, no treatment is necessary. The patient should nevertheless be examined at intervals of several weeks for any abnormalities, especially for fever and evidence of cardiac valvular injury.

To suggest further diagnoses would be guesswork, but hidden, symptomless abscess (renal, perirenal, prostatic) may be mentioned.

PANCREATIC EXTRACTS FOR PERIPHERAL VASCULAR DISEASE AND ARTERIOSCLEROSIS

To the Editor:—Of what use are pancreatic extracts in the treatment of peripheral vascular disease and arteriosclerosis? I am familiar with Dragstedt's experimental use of lipocain in arteriosclerosis and have read the discussion of Wolff's "Desympatone" *The Journal*, Oct. 26, 1940, (p. 1454), which is not very conclusive. Have there been any good clinical studies of the effect of a fat mobilizing pancreatic extract in these conditions? Is a reliable preparation of this sort available for clinical use?

Elaine M. Thomas, M.D., Chicago.

ANSWER.—There have been several clinical studies of the use of pancreatic tissue extract (insulin, histamine and choline free) in peripheral vascular disease. Whatever beneficial effects have been obtained with these extracts have been attributed by the users not to a fat mobilizing enzyme but to a vasodilating substance titrated according to its ability to neutralize the effects of epinephrine. It is understood that this vasodilating substance is not peculiar to pancreas but is found in several other tissue extracts.

Klein, Saland and Zurrow (Pancreatic Tissue Extract [Insulin Free] in the Treatment of Peripheral Vascular Disease, *Ann. Int. Med.* 18:214 [Feb.] 1943) found that tissue extract injected intramuscularly in 3 cc. doses twice a week for relatively long periods (six to eighteen months) produced improvement in claudication time and rest pain but had no effect on existing tissue changes. They could not confirm the observations of Fisher, Duryea and Wright (Deproteinized Pancreatic Extract [Depropanex] *Ann. Heart J.* 18:425 [Oct.] 1939) that pancreatic tissue extract produced an immediate improvement in claudication time. Gorham and Climenko (The Role of Insulin Free, Histamine Free Pancreatic Tissue Extract in the Treatment of Peripheral Vascular Disease, *Ann. Heart J.* 25:486 [April] 1943), using the same type of pancreatic tissue extract, found it to have a beneficial symptomatic effect on nearly all patients with peripheral vascular disease when vasospasm was a prominent feature. In their series, patients obtained relief for periods of one to six months with administration at intervals of two to seven days. The pancreatic tissue extracts used in these studies included Depropanex (Sharp and Dohme), Tissue Extract No. 568 (Sharp and Dohme) and Pancreatic Hormone (Grant).

There have been no extensive clinical studies made of the effect of fat mobilizing pancreatic substances on arteriosclerosis and peripheral vascular diseases. Choline and lipocain have thus far been studied chiefly in their effects on experimental animals. The standardization of lipocain is difficult. Its use in a single case of xanthoma tuberosum (Rosenak, B. D.: *Ann. Int. Med.* 19: 514 [Sept.] 1943) was reported to have been without effect on the lesions or plasma lipids. However, in following the implications of this question we presume to possess a greater knowledge of the pathogenesis and course of arteriosclerosis than is the case at present. It is not at all certain that arteriosclerosis is dependent primarily on a hyperlipemia, although Leary (*Arch. Path.* 32:507 [Oct.] 1941) has offered an interesting series of demonstrations to show that cholesterol esters are deposited in the subendothelium of the aorta by wandering tissue cells and the arteriosclerotic process thus initiated. Others believe that the accumulation of lipids in an artery is secondary to medial injury. Furthermore, Leary differentiates between atheroma formation in the subendothelium, which he states is a reversible process, and atherosclerosis, which is a permanent chronic process due to prolonged stay of cholesterol esters in the intima. He believes the latter responsible for most of the important lesions listed under arteriosclerosis. The ability to remove atheromas, according to Leary, is chiefly a cellular function, being performed by fixed cells, "lipolytic fibroblasts," and this ability disappears gradually with age and other factors. However, even if it is assumed that these demonstrations open an avenue of therapy, it is difficult to see how proper clinical evaluation of any chemical agent can be made on the basis of its ability to mobilize fat from the blood vessels, since atherosclerotic changes cannot be detected by x-ray examination and most workers agree that there is no fixed relationship between blood lipid levels and arteriosclerosis.

ACETARSONE FOR SYPHILIS

To the Editor:—What is the consensus concerning the use of acetarsone (stovarsol) in the treatment of prenatal syphilis? I am particularly interested in the results of experiments in the use of acetarsone and the treatment of syphilis in adults whose veins are so small as to make intravenous treatment impossible. Cecil A. Z. Sharp, M.D., Joliet, Ill.

ANSWER.—Acetarsone is not suitable for the treatment of syphilis in adults, whether orally or by any parenteral route. The drug produces a high incidence of serious toxic reactions and cannot be recommended.

SHOCKLIKE STATE AFTER PNEUMONIA

To the Editor:—A man with an extensive right lower lobe pneumonia, probably pneumococcal, did not respond to sulfadiazine therapy in forty-eight hours and was given penicillin. On the fifth day of his illness his temperature began to drop and within twenty-four hours it dropped to 97 F. With this drop in temperature his pulse became rapid and thready, his color was ashen gray and his respirations were rapid and shallow. The blood pressure was 100 systolic and 88 diastolic. There was no pulmonary edema. There was no evidence of congestive heart failure. The heart sounds were of fair quality. I would appreciate the following information: 1. What is the probable mechanism of this reaction? 2. Are hemoconcentration, diminished circulating blood volume, capillary stasis and arteriolar spasm present? 3. What form of therapy is indicated to combat this emergency? 4. Are epinephrine, nikethamide and caffeine with sodium benzoate of value or are they contraindicated? 5. Are plasma, blood transfusion and parenteral fluids of value?

Captain, M. C., A. U. S.

ANSWER.—The type of alarming reaction described, for some unknown reason, seems to occur more commonly after the bacterial pneumonias which complicate influenza, as in the pandemic of 1918-1919, than after typical pneumococcal pneumonia. It also occurs after viral pneumonia, influenza, typhus and other acute infections. Its occasional occurrence during the crisis of pneumococcal pneumonia gave rise many years ago to the undue apprehension which still attends that phenomenon. It may occur at any time during the course of the disease.

The replies to the questions are as follows:

1. The mechanism of the reaction is poorly understood, but the condition is evidently related to shock or the shocklike state. Whether it is the result of a general "let down," asthenia or exhaustion after a severe disease or the exhaustion, failure or disturbance of a specific center or system such as the respiratory center (Cole, R. I., in Nelson's *Loose Leaf Living Medicine* 1:203, 1920-1928. Reimann, H. A.: *The Pneumonias*, Philadelphia, W. B. Saunders Company, 1938, p. 59) or of vasomotor paralysis and failure of the circulatory system (Cecil, R. L.: *Arch. Int. Med.* 41:295 [March] 1928. Perry, C. B.: *Quart. J. Med.* 3:273 [April] 1934. Reimann: *The Pneumonias*, p. 68) is unknown. When it coincides with the crisis it may result from an inability of the particular system involved to readjust itself quickly to the suddenly changed condition arising between illness and recovery. Some (Warfield, L. M.: *THE JOURNAL*, March 14, 1936, p. 892) have ascribed the cause to "toxins" of the causative agents or to toxins resulting from their interaction with the tissues of the host. There is much to suggest a disturbance of the nervous system as an important factor. In the case described, signs of failure of the respiratory center seem to predominate over those of circulatory failure. See also Heffron, R.: *Pneumonia*, New York, Commonwealth Fund, 1939, page 545, for further discussion and references.

2. Hemoconcentration, diminished circulatory blood volume, capillary stasis and arteriolar spasm probably are present as in the other shocklike states, but the writer is unaware of any particular studies being made of the condition occurring specifically during the crisis of infectious disease.

3. The usual measures prescribed for the treatment of shock are indicated (see Warfield, *loc. cit.*).

4. The commonly used drugs mentioned have little or no value.

5. Parenteral injection of fluid, particularly of plasma, is usually advocated, but the problem of getting the fluid to move in the circulatory system seems to be of more importance than of simple replacement.

INTRAVENOUS ADMINISTRATION OF SALICYLATES
—ACTION OF COLCHICINE

To the Editor:—Because of the local widespread use of intravenous sodium salicylate and the inconvenience caused both patient and doctor thereby, could you please tell me if the intravenous use has any advantage over the oral use in patients who tolerate the drug well by mouth? As a second question I should like to ask of what particular value in cases of arthritis, neuralgia, or myalgia, where gout is no factor, would the intravenous preparation of sodium salicylate 1 Gm. and sodium iodide 1 Gm. with colchicine 0.65 mg. have over the administration of these substances by mouth? As a third question, Has colchicine any rationale in the treatment of any other disease than true gout?

E. W. Seward, M.D., Hanford, Wash.

ANSWER.—Oral administration of the ordinary doses of sodium salicylate relieves the symptoms of rheumatic fever promptly and completely, unless vomiting sets in before a sufficient amount has been absorbed. If the drug is tolerated there would be no advantage in intravenous administration, and there would be the disadvantage of inconvenience and also some danger of colloidoclastic shock if the injection is made with ordinary speed, as shown by Hanzlik, De Eds and Winter (Arch. Int. Med. 36:447 [Oct.] 1925).

However, a new slant has been given to intravenous salicylate medication by A. F. Coburn (Bull. Johns Hopkins Hosp. 7:

[Dec.] 1943). He conceives the salicylate action as an interference with the inflammatory process which produces the cardiovascular injury, especially in the polycyclic recurrences of children and young adults. This antiphlogistic salicylate effect is reflected in the return of the blood sedimentation rate. It is perhaps explainable by the prevention of the precipitation of antigen by antibody, which has been demonstrated in the test tube. It is proportional to the salicylate level of the plasma. Coburn reports that plasma concentrations of 10 to 20 mg. per hundred cubic centimeters, which are obtained by the customary dosage and which relieve the symptoms satisfactorily, do not control the inflammatory process sufficiently to obviate the cardiovascular injury and that this requires plasma levels of at least 35 mg. per hundred cubic centimeters, which can be attained by daily administration of 10 Gm. of sodium salicylate. This may be done by oral administration, but it can be accomplished much more promptly by intravenous drip and, according to Coburn, with less nausea and other salicylism. He advises 10 Gm. of sodium salicylate in 1,000 cc. of 0.9 per cent sodium chloride solution by intravenous drip during four to six hours daily for six days (in severe cases, 20 Gm. in 1,000 cc. in eight hours); then 10 Gm. by mouth daily in divided doses for two weeks or more until a normal sedimentation rate has persisted for a week. This is very different from casual intravenous injections. It is a subject for controlled study, not for perfunctory routine use. Coburn's results are promising, but he concedes that the series is too small to discount the variable course of rheumatic fever.

Intravenous administration always involves some elements of risk and should be chosen only if the indications are clearcut; the advantages definite and the dangers minimal. Mixtures rarely fulfil these requirements; there is no therapeutic advantage in the intravenous injection of a salicylate-iodide-colchicine mixture, and it would be difficult to defend such practice in case of untoward reactions.

The action of colchicine in gout is unique and has not been adequately explained. It is effective only with doses that verge on the toxic. It has not been shown to be effective in other conditions, and such use is inadvisable especially in view of its toxicity.

FUNGUS INFECTION OF NOSE

To the Editor:—A white man aged 30 has had a chronic vasomotor rhinitis for the past five years. Skin tests for possible allergy revealed a 3 plus reaction to dust and a 1 plus reaction to chocolate, rice, pear, cherry, cinnamon, grasses and ragweed. Allergic management failed to give relief. Following chemical cauterization seven months ago of the right inferior turbinate there was a severe aggravation of the symptoms. X-ray examinations of the sinuses were negative on three occasions, but clinically, during the winter, the patient has had sinusitis. Nasal smears on three occasions were negative for eosinophils but did reveal rather numerous yeast cells (2 to 3 per field). Cultures to identify the yeast organisms were unsuccessful on three occasions because of contamination with air borne molds. Owing to the character of the mucous secretion (thick, white, sticky) one is led to believe that this finding of yeast cells is of some significance. Will you kindly discuss the problem of nasal fungus infection and its management?

M. D., Illinois.

ANSWER.—Castellani says that "yeastlike and other fungi are often observed in the nasal mucus; they may play only a saprophytic role or they may give rise to an inflammation of the mucosa."

True yeast infection of the nasal mucosa and sinuses must be rare, in this country at least. Its occurrence is not mentioned in a single one of a dozen well known textbooks on rhinology.

All observers are agreed that the commonest pathogenic fungi to be seen in the nose belong to the *Aspergillus* family. Practically all observers are agreed also that the symptoms of fungous infection of the nose closely resemble those seen in allergic rhinitis. Especially are the bouts of sneezing emphasized.

The yeast cells described in the query, because they appeared after chemical cauterization of the nasal mucosa, may not be playing a pathogenic role but might be saprophytic in nature. Granting for sake of argument that they are truly disease causing, the treatment, which is far from being well defined, will vary, depending on whether the nasal mucosa alone or the accessory nasal sinuses (particularly the maxillary) are involved.

If the nasal mucosa alone is involved, iodine appears to be a favorite remedy. Lugol's solution may be given by mouth in increasing doses; so also may potassium or sodium iodide be given in the conventional amounts. There seems to be little said or done about the use of antiseptics or other medicaments locally in the nose.

When the disease is present in the sinuses (most often the maxillary) the usual irrigations should be, according to most authorities, good reason for removing the diseased mucosa operatively, preferably by way of a Caldwell-

